Service Manual

CHRISTINI AWD 300/250

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HOW TO USE THIS MANUAL

Read this Manual carefully. You will find it contains all the necessary information for your safety, and that of other persons, as well as guaranteeing the correct conservation and maintenance of the GAS GAS motorcycle that you have just acquired. You will find all the necessary instructions for the correct riding and control of this vehicle are set out below. Each message is preceded by a symbol with the following meaning:

WARNING

This warning symbol identifies special instructions or procedures which, if not correctly followed, could result in personal injury or even death.

CAUTION

This symbol identifies instructions or procedures which, if not followed strictly, could result in damage to or destruction of equipment.

NOTE

This note symbol indicates points of particular interest for more efficient and convenient operation.

Motorcycle riding, if improperly conducted, has the potential to cause environmental problems as well as conflicts with other people. Responsible riding use of your motorcycle will ensure that these problems and conflicts do not develop.

TO PROTECT THE FUTURE OF YOUR SPORT MAKE SURE YOU USE YOUR MOTORCYCLE WHITHIN THE LAW, SHOW CONCERNFOR THE ENVIRONMENT, AND RESPECT THE RIGHTS OF OTHER PEOPLE.

Motorcycle riding is a wonderful sport, and we hope you will enjoy it to the fullest.

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Specifications

ENGINE		2 cycles, single cylinder, crankcase intake, liquid cooled
250 cc Engine		
Bore and stroke		66.4 x 72 mm
Displacement		249.3 cc
300 cc Engine		
Bore and stroke		72 x 72 mm
Displacement		294.7 cc
Carburettor, diameter of diffusor		38
Lubrication system		Mixture
	100% Synthetic Oil	50:1 = 2%
	Mineral Oil (Only USA)	32:1 = 3%
Starting system		Starting lever - Electric start
Ignition system		CDI system
Ignition timing		1 mm BTDC

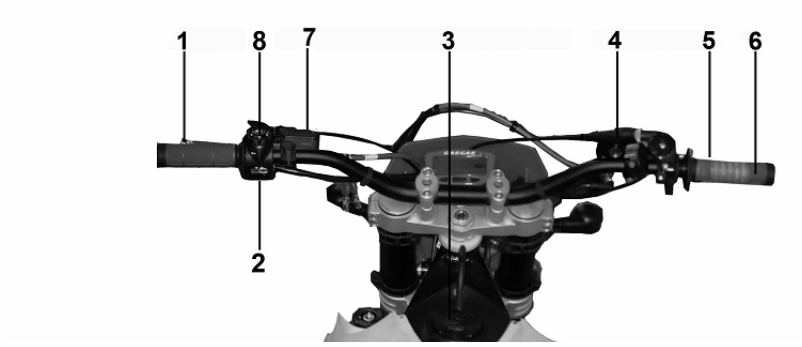
TRANSMISSION		
Transmission type		6 speed in cascade
Clutch type		Hydraulic operated multi-plate in oil bath
Secondary drive		Chain driven
Gear ratio (250 cc, 300 cc)		1st 2.071 (29/14)
		2nd 1.625 (26/16)
		3rd 1.333 (24/18)
		4th 1.100 (22/20)
		5th 0.913 (21/23)
		6th 0.791 (19/24)
Primary reduction		2.85 (57/20) (250 cc, 300 cc)
Final reduction		3.692 (48/13) (250 cc, 300 cc)
Transmission oil	Capacity	900 cc (250 cc / 300 cc)
	Type	10W30 API SF or SG

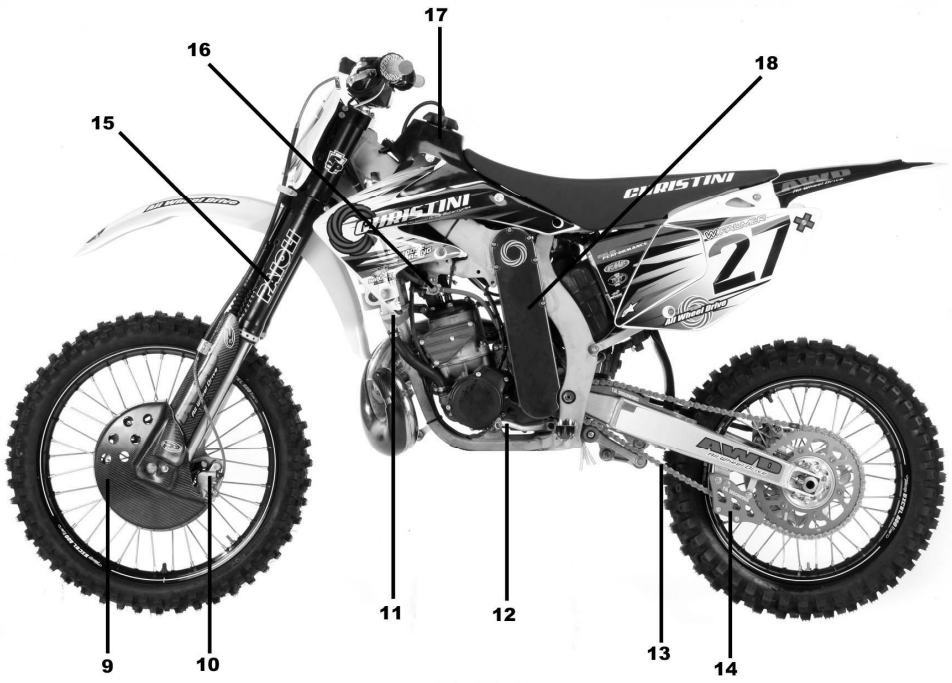
CHASSIS		
Type		Tubular, semi-double cradle
Tire size	Front	EC - 90/90 x 21
	Rear	EC - 140/80 x 18
Suspension	Front	Inverted telescopic fork ø 45 mm (Cross Country)
		Inverted telescopic fork ø 48 mm (**EC** *250, 300*)
	Rear	Progressive system with single multi-adjustable shock
Suspension stroke	Front	282 mm
	Rear	320 mm
Front fork oil		SAE 5 - 7.5
Front fork oil level		110 mm (compressed, without spring)

BRAKES		
Type	Front, Rear	Disc brake
Effective disc diameter	Front	260 mm
	Rear	220 mm

DIMENSIONS	
Overall height	1260 mm
Overall length	2135 mm
Overall width	810 mm
Seat height	940 mm
Minimum height	340 mm
Wheelbase	1475 mm
Fuel tank capacity	9.5 l

Location of Components





1- Clutch lever

2– Stop/Start

3- Fuel tank cap

4– Brake fluid reservoir

5– Front brake lever

6– Throttle

7– Clutch fluid reservoir

8– Choke trigger

9- Brake disc

10– Front brake caliper

11- Radiator

12– Shift pedal

13– Primary chain

14– Chain guard

15– Front suspension

16- Gasoline petcock

17– Gas tank

18– Carburetor (behind AWD chain cover)

19– Muffler (behind panel)

20– Seat

21– Rear shock

22- Rear brake caliper

23- Suspension linkage

24- Rear brake pedal

25- Kick-start

26– Exhaust

The GAS GAS EC 2-cycle engines require a mixture of gasoline and oil. Use gasoline with an octane rating equal to or higher than that shown in the table.

OCTANE RATING METHOD		MINIUM RATING
Antiknock Index	(RON+MON)/2	90
Research Octane No.	(RON)	98

NOTE

If knocking or pinging occurs, try a different brand of gasoline or higher octane grade.

WARNING

Gasoline is extremely flammable and can be explosive under certain conditions. Always stop the engine and do not smoke. Make sure the area is well ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

Mixing oil inside the engine

Oil must be mixed with gasoline to lubricate the piston, cylinder, crankshaft, and connecting rod bearings.

Recommended oil:

2-CYCLE SYNTHETIC

NOTE

If the recommended oil is not available, use only oil designed for racing with 2-cycle engines.

Gasoline and engine oil mixing proportions:

Synthetic oil 100%: gasoline 50, engine oil 1 = 2%

Semi-synthetic oil: gasoline 50, engine oil 1 = 2%

Mineral oil: gasoline 32, engine oil 1 = 3%

CAUTION

Do not mix vegetable and mineral based oils.
Too much oil will cause excessive smoking and spark plug fouling.
Too little oil will cause engine damage or premature wear.

CAUTION

Below 0 °C do not use 100% synthetic oil.

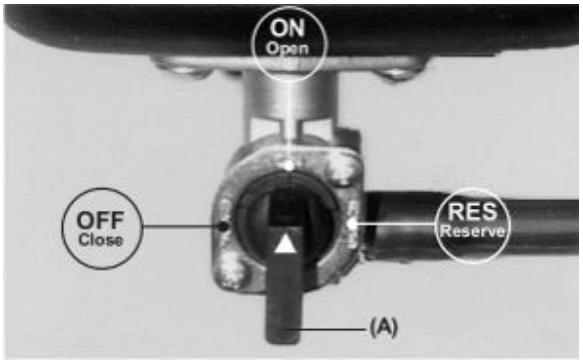
To prepare the mixture, first pour oil and half of the gasoline used into a container and stir the mixture thoroughly. Then add the rest of the gasoline and stir the mixture well.

NOTE

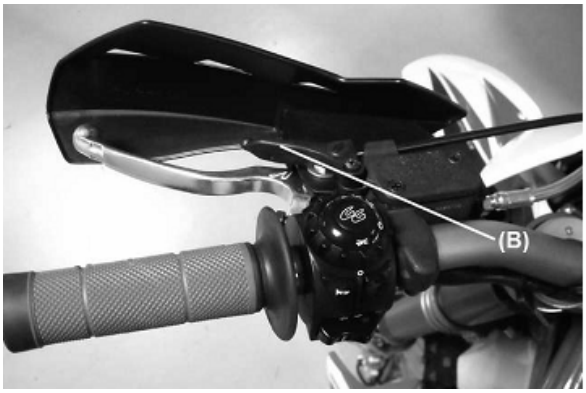
At low temperature, oil will not easily mix with gasoline. Take time to ensure a well-blended mixture.
The lubrication quality of this mixture deteriorates rapidly; use a fresh mixture for each day of operation.

1. Make sure the motorcycle is in the neutral position.

2. Turn the gasoline cock (A) clockwise to the "ON" position.



3. If the engine is cold, pull up the choke trigger (B).



NOTE

- *When the engine is already warm or on hot days, open the throttle instead of using the choke knob.*
- *If the engine is flooded, kick with the throttle fully open.*
- *If the clutch lever is pulled, the motorcycle can be started while in any gear.*

4. Start the motorcycle with kick-start pedal (C) or push the start button (D).

5. Even after the engine starts, keep the choke knob pulled up.

Stopping the engine

1. Shift the transmission into neutral.
2. After racing the engine slightly, close the throttle completely and depress the engine stop button (E).

Shifting Motorcycle

The transmission is a 6-speed, of the return shift type. A return shift means that to go from first gear to third gear it must go first through the second gear, that is to say that it upshifts gears one by one. To engage first gear from neutral, pull the clutch lever in and push down on the gearshift pedal (A), then release the gearshift pedal and gently release the clutch lever.

CAUTION

When shifting gears, press firmly on the gearshift pedal to ensure a positive shifting. Careless, incomplete shifts can cause the transmission to jump out of gear and cause engine damage.

Stopping Motorcycle

For maximum deceleration, close the throttle (A) and apply both front and rear brakes. Disengage the clutch as the motorcycle comes to a stop. Independent use of the front or rear brake may be advantageous under certain conditions.
Downshift progressively as speed is reduced to ensure good engine response when you want to accelerate.

Break-In

A break-in period is necessary to ensure a smooth operation and obtain an optimum engine and the transmission responses. During the first hour or 20 km of operation, run the engine at low and moderate speeds and revolutions per minute (RPM).

NOTE

The slow riding necessary during the break-in period may cause carbon deposits to build up on the spark plug and foul it.

If inspection of the spark plug shows this to be the case, replace the standard spark plug with another of a higher heat range.

Perform the break-in period following these steps:

1. Start the engine and let it run at idle until the engine is warm.
2. Stop and let the engine cool completely.
3. Start the engine and ride for 10 minutes at moderate speed -NEVER ACCELERATE HARD.
4. Stop and let the engine cool completely. Be sure to check and adjust chain slack and spoke tightness and carry out a general inspection.
5. Start the engine and ride for 20 minutes at moderate speed. -NEVER ACCELERATE HARD.
6. Stop and let the engine cool completely. Check and adjust as needed (Refer to the table of adjustments).
7. Install the removed parts.
8. Fill the radiator with the recommended coolant. Before starting the motorcycle, bleed the air from the cooling system.
9. Start the engine and ride for 30 minutes at moderate speed.
10. Stop and let the engine cool completely. Check and adjust.
11. After the break-in procedure has been properly carried out, the motorcycle is ready for regular operation.

CAUTION

However, avoid accelerating recklessly which can lead to engine failure. Be careful to use the necessary skills and techniques while operating the motorcycle.

NOTE

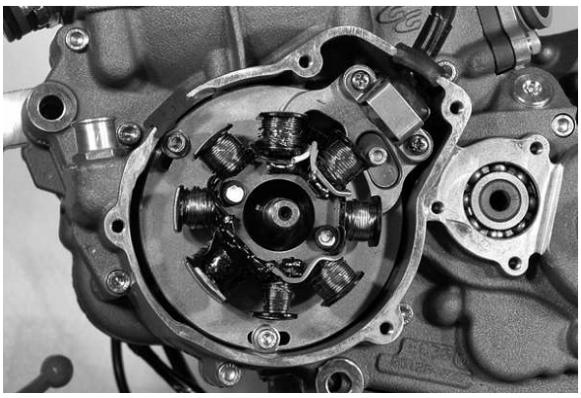
After the break-in period, install a new set of standard spark plugs.

Maintenance Schedule

Item	Check / Inspect	Adjust	Change / Replace	Clean	Apply grease / Lubricate
Clutch	At each fill up	At each fill up	At each fill up*	-	At each fill up
Discs	3 fill ups	3 fill ups*	3 fill ups*	-	-
Throttle cable	-	1 fill up	-	-	-
Spark plug	-	-	-	1 fill up	-
Air cleaner element	-	-	When damaged	1 fill up	-
Carburetor	1 fill up	1 fill up	-	-	-
Transmission oil	-	-	3 fill ups	-	-
Piston and piston ring	3 fill ups	3 fill ups*	3 fill ups*	3 fill ups	-
Cylinder head, cyl. & exhaust valves	3 fill ups	3 fill ups*	3 fill ups*	-	-
Exhaust	1 fill up	1 fill up*	1 fill up*	1 fill up	-
Muffler gasket	-	10 fill ups*	10 fill ups	-	-
Piston bearing	3 fill ups	3 fill ups*	10 fill ups	-	3 fill ups
Kick-start pedal and gearshift pedal	-	-	-	-	1 fill up
Exhaust pipe o'ring	-	-	3 fill ups	-	-
Engine bearings	10 fill ups	10 fill ups*	10 fill ups*	-	-
Coolant	3 fill ups	3 fill ups*	3 fill ups*	-	-
Radiator tube and connections	1 fill up	1 fill up*	1 fill up*	-	-
Brake adjustment	3 fill ups	3 fill ups*	3 fill ups*	-	-
Brake pads wear	5 fill ups	5 fill ups*	5 fill ups*	-	-
Brake fluid level	3 fill ups	3 fill ups*	3 fill ups*	-	-
Brake fluid	-	-	Every 2 years	-	-
Brake pump piston & dust cover	-	-	Every 2 years	-	-
Brake caliper piston seal & dust seal	-	-	Every 2 years	-	-
Brake hose and pipe	-	-	Every 4 years	-	-
Spoke tightness and rim runout	1 fill up	1 fill up*	1 fill up*	-	-
Lubricate drive chain	-	-	-	-	1 fill up
Drive chain	1 fill up	-	-	-	-
Drive chain wear	-	5 fill ups	5 fill ups	-	-
Chain slider	5 fill ups	5 fill ups*	5 fill ups*	-	-
Front fork	1 fill up	When necessary	When damaged	When necessary	-
Front fork oil	-	-	Every year	-	-
Nuts, bolt, fasteners	5 fill ups	5 fill ups*	5 fill ups*	-	-
Fuel hose	7 fill ups	7 fill ups*	7 fill ups	-	-
Fuel system	-	-	10 fill ups	When necessary	-
Steering play	1 fill up	-	-	-	-
Rear sprocket	5 fill ups	5 fill ups*	5 fill ups*	-	-
General lubrication	5 fill ups	-	-	-	5 fill ups
Steering bearing	-	-	-	-	10 fill ups
Wheel bearing	10 fill ups	10 fill ups*	10 fill ups*	-	-
Swingarm and linkages	5 fill ups	5 fill ups*	5 fill ups*	-	5 fill ups
Rear shock absorber oil	Every 2 years	2 years*	2 years*	-	-
E-start Bendix grease	10 fill ups	-	-	When necessary	When necessary

The maintenance and adjustments in this table are easy to follow and must be carried out to keep the motorcycle in good running condition.

NOTE: (*) Inspect and carry out these operations only if it is necessary.



This motorcycle uses a capacitor discharge ignition system (CDI). The ignition system should never require adjustment unless the stator of the magnetic flywheel was incorrectly installed during engine reassembly. If necessary, inspect and adjust as follows:

Adjustment

- Remove the magnetic flywheel cover.
- Make sure that the mark on the stator plate is aligned with the mark on the crankcase.
- If the marks are not aligned, loosen the magnetic inertia wheel screws and turn it.
- Tighten the screws securely.
- Install the magnetic flywheel cover.

NOTE

Engine tune-up can be adjusted to match the rider´s preferences and skills.

- Remove the magnetic flywheel cover.
- Loosen the stator screws.
- Adjust the engine tune-up by changing the position of the stator within prudent limits

NOTE

For the best engine performance, it is very important to adjust the engine tune-up within the set of limits described.

- Tighten the stator screws.
- Install the magnetic flywheel cover.
- Test ride the motorcycle and readjust the engine tune-up, if necessary.

Radiator Hoses

Check the radiator hoses for cuts or deterioration, and the connections for looseness and leaks.

Radiator

Check the radiator fins for obstructions (insects or mud). Remove any obstructions with a stream of low water pressure.

CAUTION

If high water pressure is used the radiator fins could be damaged and impair the radiator effectiveness. Do not obstruct or deflect airflow through the radiator by installing unauthorized accessories. Any interference with the radiator airflow can lead to engine overheating and damage.

Coolant information

To protect the cooling system aluminum parts (engine and radiator) from rust and corrosion, the use of corrosion and rust inhibitors chemicals in the coolant is essential. If rust inhibitors were not used, over a period of time the radiator will be corroded. This will clog the tubes of the cooling system.

CAUTION

Use of incorrect coolant solutions will cause engine and cooling system damage. Use coolant containing corrosion inhibitors made specifically for aluminum engines and radiators in accordance with the instructions of the manufacturer.

WARNING

Chemical liquids are harmful to the human body. Follow manufacturer instructions.

CAUTION

Distilled water must be used with corrosion inhibitors and the antifreeze in the cooling system. If tap water is used in the system, the cooling tubes can be clogged and reduce the cooling system efficiency.

If the lowest ambient temperature encountered falls below the freezing point of water, protect the cooling system. Use a permanent type of antifreeze in the cooling system (distilled water and ethylene glycol and corrosion inhibitors for aluminum engines and radiators). For the coolant mixture ratio under extreme conditions, choose the mixture ratio listed on the container for the lowest ambient temperature.

CAUTION

Permanent types of antifreeze have anticorrosion and anti-rust properties. When it is diluted excessively, it loses its antifreeze and anticorrosion properties. Mix in accordance with the instructions of manufacturer.

Liquid recommended

Permanent type of antifreeze (distilled water and ethylene glycol) plus corrosion inhibitors for aluminum engines and radiators.

NOTE

Initially, at the factory a permanent type of antifreeze is installed in the cooling system. It is colored green, it contains a 50% solution of ethylene glycol, and has a freezing point of –35 ºC.

Coolant recommended

Coolant absorbs excessive heat from the engine and transfers it to the air at the radiator. If the coolant level is low, the engine overheats and may suffer severe damage. Check the coolant level each day before riding the motorcycle. Add liquid recommended if the level is low (see next page).

WARNING

To prevent severe scalding do not remove the radiator cap or try to change liquid, when the engine is still hot. Wait until it cools.

Coolant level

- Place the motorcycle in riding position.
- Turn the radiator cap counterclockwise and wait a few seconds until vapors inside are released. Then push and turn it further in the same direction and remove the cap.

NOTE

Check the level when the engine is cold.

- Check the coolant level. The coolant level should be just at a level below the cap rubber seal.
- If the coolant level is low, add the correct amount of coolant through the filler opening.

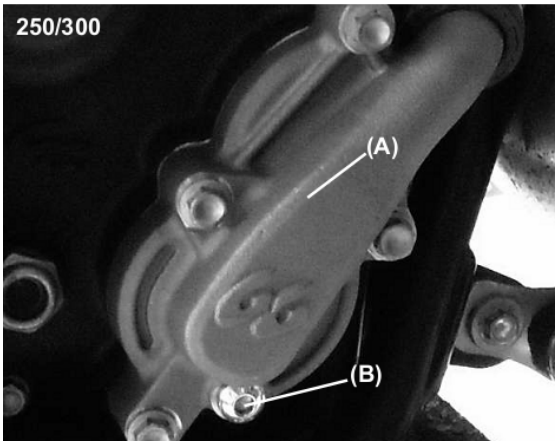
Total quantity

Mix antifreeze and distilled water 1:1 (distilled water 50%, antifreeze 50%).
Capacity: 1.1 L

Coolant Replacement

Coolant should be changed periodically to ensure long engine life.

- Wait for the engine to cool completely.
- Place the motorcycle in riding position.
- Remove the radiator cap.
- Place a container under the coolant drain screw, and drain the coolant from the radiator and engine by removing the drain screw (B) at the bottom of the water pump cover (A). Wash off immediately any coolant spilled on the chassis, engine, or wheels.



WARNING

If coolant gets on the tires will make them very slippery and can cause an accident.

- Visually inspect the old coolant. If whitish spots are observed in the liquid is a clear indication that the aluminum parts in the cooling system are corroded. If the coolant is brown, iron or steel parts of the system are rusting. In both cases, flush the cooling system.
- Check the cooling system for damage, leaks or missing gaskets in the cooling system.
- Install the water pump cover drain screw with the specified torque values shown in the table. Always replace the gasket with a new one.

Drain plug tightening torque (refer to torque table)

Water pump screw: 9 Nm

- Fill the radiator up to the edge of the cap with coolant, and install the radiator cap.
- Inspect the cooling system for leaks.
- Start and warm up the engine, then stop the engine.
- Check the coolant level after the engine cools down. Add coolant up to the cap.

The standard spark plug is a shown in the table and should be tightened to 27 Nm.

Standard Spark Plug
250 / 300 cc Denso W24ESR-U 0.7-0.8 mm OR NGK BR8EG

The spark plug should be removed periodically to check its gap. If the plug is oily or has carbon deposits, clean it with a sandblaster. After removing the abrasive particles, the spark plug must be cleaned using a wire brush or a similar tool. Measure the gap with a feeler gauge, if incorrect adjust the gap by bending the side electrode. If the spark plug electrodes are corroded or damaged, or if insulator is cracked, replace the plug.

NOTE

Inspect every 30 hours and change every 60 hours.

To find out whether the right heat range plug is being used, remove it and inspect the ceramic insulator around the center electrode. If the ceramic is light brown, the spark plug is correctly matched to engine temperature. If the ceramic is white, the spark plug should be replaced with the next colder plug. If the ceramic is black, the spark plug should be replaced with the next hotter plug.

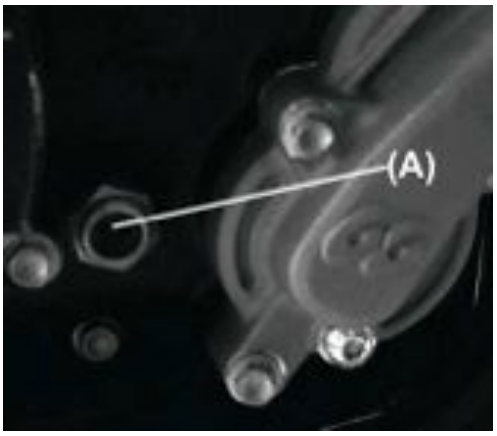
NOTE

If the engine performance drops, replace the spark plug first to recover its output.

For the transmission and clutch to function properly, maintain the transmission oil level at the optimum level and change it periodically. A motorcycle with insufficient transmission oil, deteriorated or contaminated can accelerate wear and tear and cause transmission.

Oil level inspection

- Wait a few minutes if the motorcycle has been operating.
- Check the oil level through the inspection window in the lower right hand side of the engine (A).
- Oil level must be kept between the maximum and minimum marks.



- If the lever is too high, you have to remove the excess oil through the drain plug (B).

- If the level is low, add the necessary quantity of oil by opening the plug (C). Use the same type and oil manufacturer used currently with the engine.

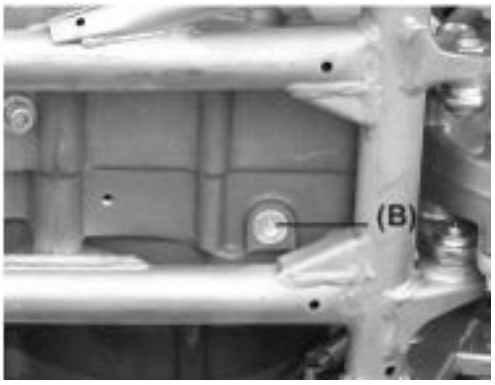
Transmission Oil

Viscosity: SAE 10W30
Capacity:900 cc (EC250-300)

Oil change

NOTE

The engine must be completely cool and then warm up the engine again for a few minutes to normal operating temperature, to register the correct engine oil temperature and to obtain an accurate oil level measurement.



- The transmission oil should be changed periodically to ensure long engine life.
- Warm up the engine for 5 minutes so any oil sediment will float.
- Stop the engine, and place an oil pan under the engine.
- Remove the drain screw (B) and place the motorcycle in riding position to allow the oil to drain out.
- Clean the drain screw magnet of any iron particles.
- Tighten the oil drain screw with its O-ring to 20-Nm.
- Remove the oil filler opening plug (C) and pour 900 cc of new transmission oil for the models 250 / 300.
- Check the oil level, after kicking the kick-start pedal 3 or 4 times.
- Install the oil filler opening plug.

A clogged air filter restricts the engine air intake, increasing fuel consumption, reducing engine power, and causing spark plug fouling.

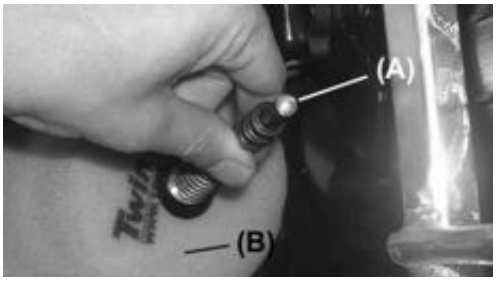
WARNING

A clogged air filter may allow dirt and dust to enter the carburetor and stick the throttle open. This could cause an accident. A clogged air filter may allow dirt and dust to enter the engine causing excessive wear and tear and other damages. Do not omit checking the element, before and after each race or practice session. Clean it if necessary.

Element Cleaning

WARNING

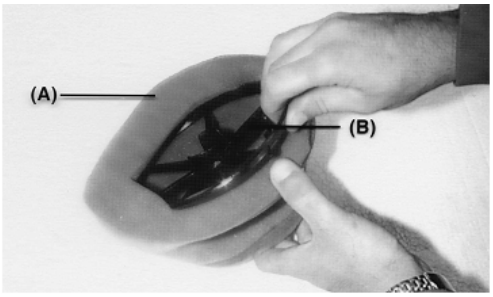
Clean the element in a well-ventilated area, and make sure that there are no sparks or flame anywhere near the working area (this includes any appliance with a pilot light). Do not use gasoline to clean the element because could cause an explosion. To access the air filter, remove the seat by removing the bolt that secures it.



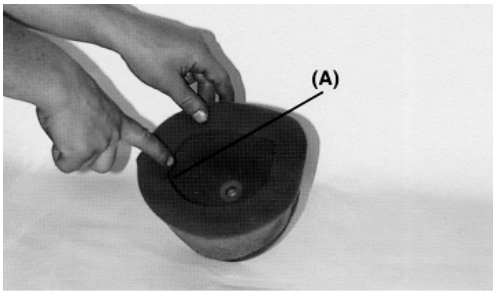
To access the air filter, remove the seat by removing the bolt that secures it.
- Remove the cover.
- Remove the screw (A) and remove the filter (B).
- Place a lint-free towel in the intake port of the carburetor so no dirt is allowed to enter the carburetor.

CAUTION

Do not turn the filter since it can be easily damaged or torn.



- Wipe out inside the air filter housing with a clean damp towel.
- Pull the cage (B) out of the air filter (A).
- Clean the filter using a soft bristle brush in a bath of filter cleaning fluid.
- Squeeze it dry with a clean towel. Do not wring the element or blow it dry since it can be damaged.
- Inspect the filter for damage such as tears, hardening, or shrinkage. If damaged, replace it or it will allow dirt into the carburetor.
- Apply grease to all connections and screws in the air filter and intake ports.
- Install the filter in the cage and pack the filter lip with grease (A), to ensure good sealing and prevent dirt entrance.
- Install the air filter in the motorcycle and make sure it is correctly secured.



THROTLE CABLE

- Check that the throttle grip turns smoothly.
- Check that the throttle grip has 2-3 mm of free play.
- If the free play is incorrect, loosen the locknut on the upper end of the throttle cable, and turn the adjuster to obtain the correct amount of free play.
- Tighten the locknut again.
- If the free play cannot be set by adjusting the cable, remove the cable protector in the throttle body. Make the necessary free play adjustments with the tensor at the end of the cable, tighten the locknut, and reinstall the protector.

(A). Adjuster.
(B). Locknut.
(C). Throttle grip.

CARBURETOR

Idle speed adjustment

Is carried out using the air screw (A) and idle screw (B).

- First turn in the air screw until it is loose, then tighten it 1 1/2 turns.
- After thoroughly warming up the engine, turn the idle adjusting screw to obtain the desired idle speed. If there are no idle preferences, turn the screw until the engine stops.
- Tighten lightly the idle screw.

(A). Air screw.
(B). Idle screw.

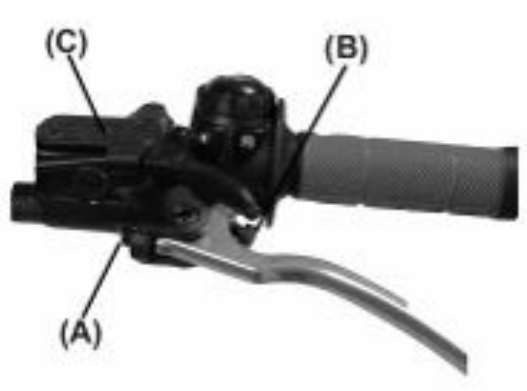
- Open and close the throttle a few times to make sure the idle speed does not change. Readjust if necessary.
- With the engine idling, turn the handlebar to each side. If handlebar movement changes the idle speed, the throttle cable may be improperly adjusted or routed incorrectly, or it may be damaged. Be sure to correct any of these conditions before riding.

WARNING

Riding with a damaged throttle cable could be dangerous.

CLUTCH

The clutch lever should have a maximum play of 3 mm. This margin increases with the wear on the clutch plate.



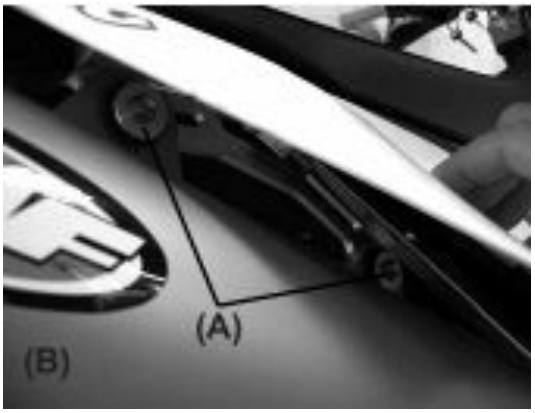
To adjust, proceed as follows:
- Use bolt A to adjust the lever's range of movement to the rider's convenience.
- Adjust the play of the lever using bolt B.

WARNING

- Maintain the clutch lever with the play shown, otherwise the performance and useful life of the clutch may be adversely affected.
- This model uses mineral oil GRO ULTRA 5 for the clutch hydraulic circuit.
- Tank C must not be filled with brake liquid.

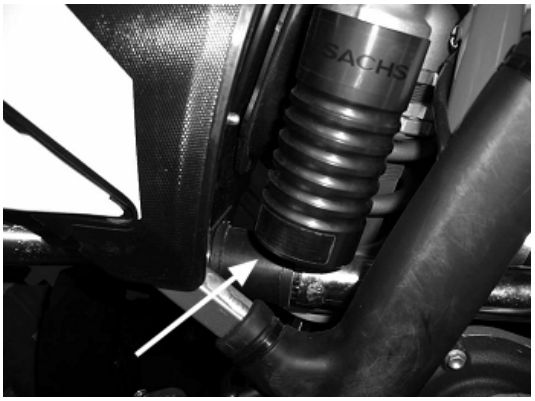
EXHAUST SYSTEM

The exhaust and the muffler reduce the noise and send gases away from the rider. If the exhaust is badly damaged, dented, cracked or rusted, replace it with a new one. Replace the muffler fiber if the exhaust noise becomes too loud or if the engine performance drops.



Muffler replacement

- Remove the retaining screws of the right side number-posting cover.
- Remove the retaining screws (A) of the muffler (B) and remove the muffler towards the rear.
- Separate the silencer from the joint (see arrow).
- Replace the muffler and reinstall the assembly.



Changing the silencer packing

- Remove all three screws.
- Remove the inside core of the muffler.
- Replace the muffler fiber by wrapping it around the inner tube.
- Reinstall the assembly.

-(A). Screw.
-(B). Silencer.

DRIVE CHAIN

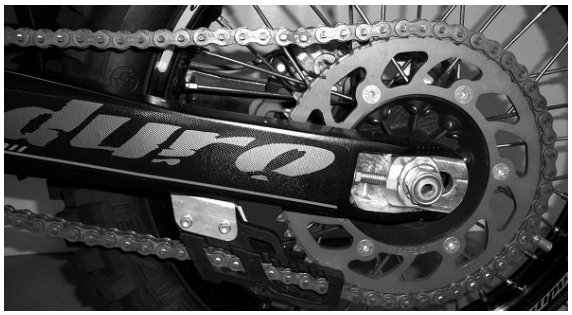
The drive chain must be checked, adjusted, and lubricated in accordance with the Maintenance Schedule. If the chain is worn or adjusted incorrectly (either too loose or too tight) the chain could become loose or break. Replace the chain, if necessary.

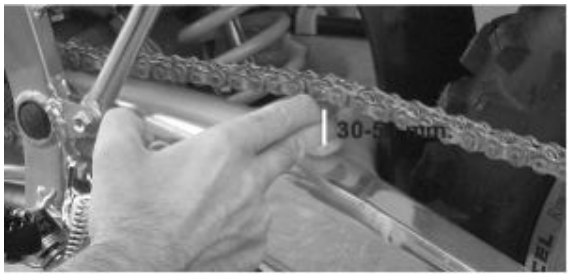
WARNING

A chain that breaks or becomes loose could snag on the engine or on the rear wheel, severely damaging the motorcycle and causing it to go out of control.

Drive Chain Slack Inspection

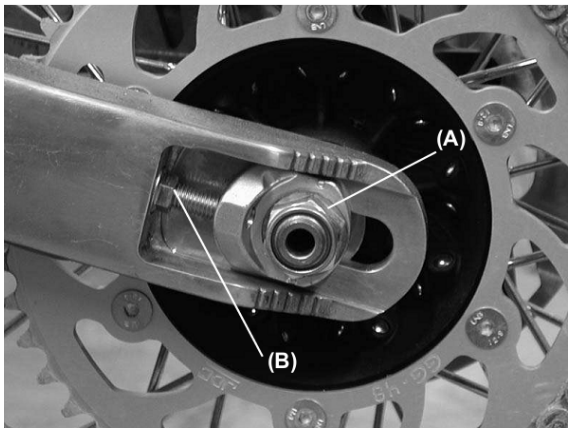
The space between the chain and the swingarm at the same height of the chain slider should be 30-50 mm. Rotate the rear wheel to find the place where the chain is tighter. Adjust the drive chain if it has too much or too little slack. In addition to checking the slack, rotate the rear wheel to inspect for damaged rollers, loose pin and links, unevenly or excessively worn teeth, and damaged teeth.





Drive Chain Slack Adjustment

- Loosen the rear axle nut (A).
- Turn the nuts on the chain adjusting tensors (B) until the drive chain has a gap of 30-50 mm between the chain and the swing arm. To keep the chain and wheel aligned, the left chain tensor should aligned with the right chain tensor.



WARNING

Misalignment of the wheel will result in abnormal wear and may cause an unsafe riding condition.

NOTE

Wheel alignment can also be checked using the string method.

- Tighten the chain tensor nuts (B).
- Tighten rear axle nut to 98 Nm.
- Rotate the wheel, measure the chain slack again at the tightest position, and readjust if necessary.

WARNING

If the axle nut is not securely tightened an unsafe riding condition may result.

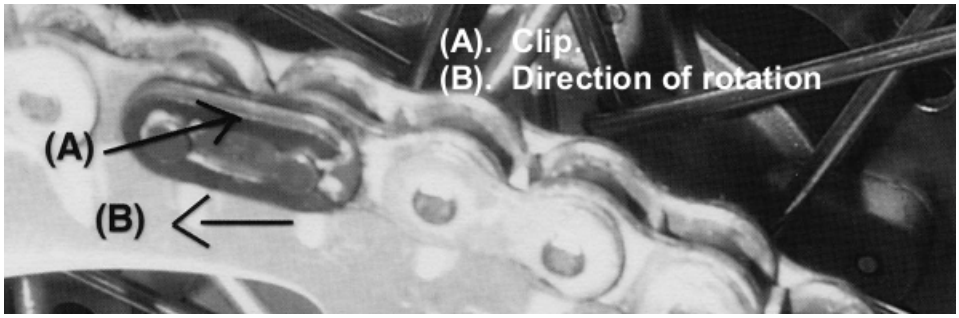
Drive chain, chain guide, chain slider, and rear sprocket teeth.

When the chain is worn so much that it is more than 2% longer than when new, it is no longer safe for use and should be replaced. Whenever the chain is replaced, inspect both the engine output pinion and rear sprocket teeth, and replace them if necessary. Worn sprocket teeth will cause a new chain to wear quickly.

NOTE

When a part is worn, replace it with a genuine part for maximum resistance and safety.

To minimize any chance of the master link coming apart, the master link clip must be installed with the closed end of the «U» facing in the direction of the chain rotation.



Chain Guide Slider

Visually inspect the upper and lower chain slider at the location of the swingarm. If damaged or worn, replace it with a new part.
(A). Chain Guide Slider.
(B). Swingarm.

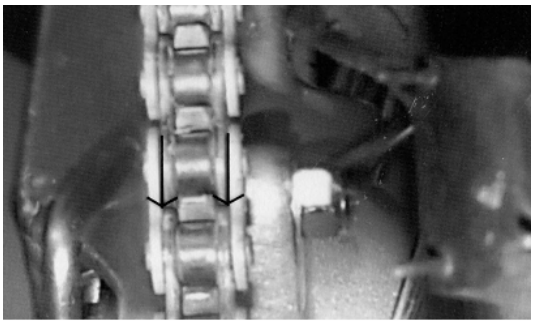
Pinion Teeth, Pinion Sprocket and Sprocket Wear

Visually inspect the pinion teeth. If they are worn or damaged, replace the pinion or the sprocket.

Lubrication

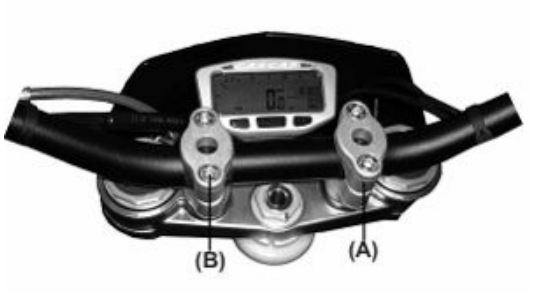
Lubrication is necessary after riding through rain or in the mud, or any time that the chain appears dry. A heavy oil is preferred to a lighter oil because it will stay on the chain longer and provide better lubrication.

Apply oil to the sides of the chain rollers for better oil penetration.
Wipe off any excess oil.



HANDLEBAR

To suit various riding positions, the handlebar position can be adjusted front to rear.



Handlebar position adjustment

Loosen the handlebar holder (A) screws (B), turn the handlebar and place it in the desired position.

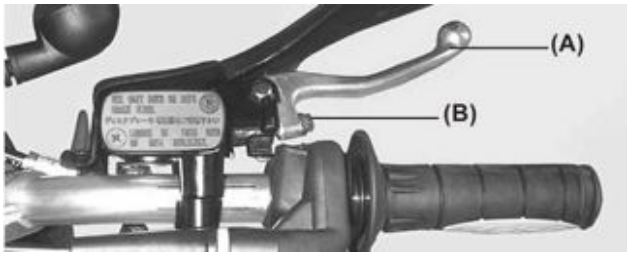
Tighten the bolts, front first and then the rear, to 25 Nm of torque.
If the handlebar is installed correctly, there will be an even gap at the front and rear after tightening (A).

BRAKES

Disc and disc pad wear is automatically compensated for and has no effect on the brake lever or pedal action. So there are no parts that require adjustment on the brakes except brake lever free play and brake pedal position

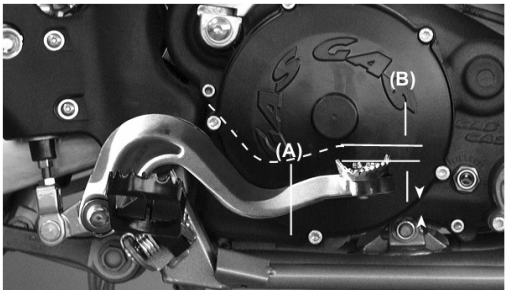
Front brake lever free play

Adjust the front brake lever (A) to match your requirements. To adjust, loosen the nut (B). After adjustment, tighten it securely. Then check that the brake response is correct.



Rear brake pedal position

When the brake pedal is in rest position, there should be a free play of 10 mm. Check the brake for good braking power and no brake drag.
(A). Brake pedal.
(B). 10 mm free play.



WARNING

If the brake pedal feels spongy when it is applied, there might be air trapped in the brake pump or the brake may be defective. Since it is dangerous to operate the motorcycle under such conditions, have the brake checked immediately.

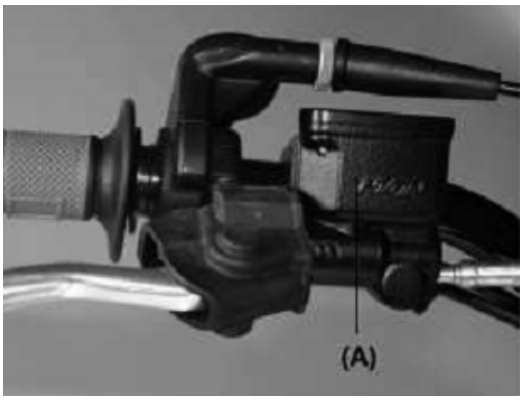
Brake fluid

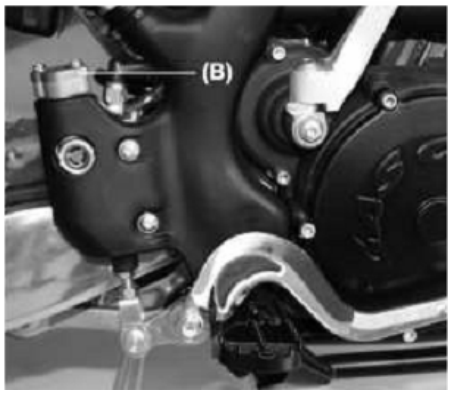
Inspect the brake fluid level and change it periodically. The brake fluid should also be changed if it becomes contaminated with dirt or water.

Liquid recommended: D.O.T 3 or D.O.T 4.

Brake fluid level inspection

The front (A) and rear (B) reservoirs must be kept more than half full with brake fluid. If the brake fluid is insufficient, add brake fluid.





CAUTION

Do not spill brake fluid onto any painted surface. Do not use fluid from a container that has been left open or that has been unsealed for a long time. Check for fluid leakage around the fittings. Check for brake hose damage.

WARNING

Do not mix different types of fluid. Change the brake fluid in the reservoirs completely if the same type of brake fluid is not available.

Brake wear inspection

If the thickness of either pad, front and rear, is less than 1 mm, replace both pads as a set. Pad replacement should be carried out only by an authorized dealer.

WHEELS

Tires

- Tire pressure affects traction, and tire life.
- Adjust the tire pressure to match road conditions and rider's preference, but do not stray too far from the recommended pressure.

NOTE

Tire pressure should be checked when the tires are cold before riding.

Road conditions

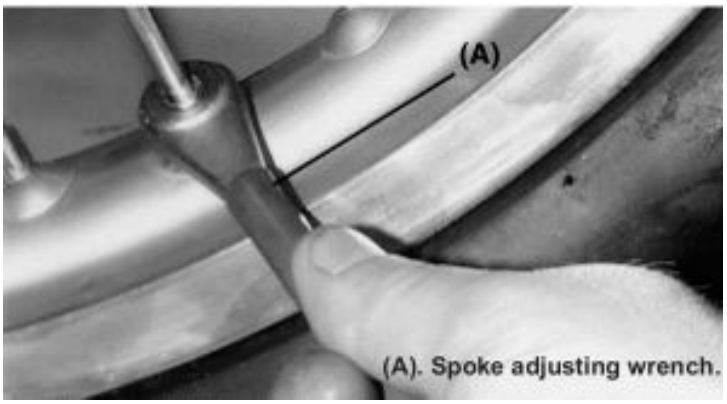
- When the road is wet, muddy, sandy or slippery, reduce the tire pressure.
- On gravel roads or hard terrain, increase the tire pressure.

Spokes and wheel rims

The spokes on both wheels must be tightened evenly and should not be allowed to have free play. Unevenly tightened or loose spokes will cause wheel rim run out, the other spokes will be stressed and might break.

Wheel rim run out

Place a dial indicator at the rim side, and spin the wheel by hand to measure the axial run out. Place the dial indicator at the inner circumference of the wheel and spin the wheel, the difference between the highest and lowest quantities is the run out. If the run out is not excessive it can be corrected tightening or loosening some spokes with the spoke adjusting wrench (B). If the wheel rim is curved or bent it must be replaced.



NOTE

A welded area on the rim may indicate excessive run out. Disregard this when measuring rim run out.

1- Preparation for washing

Before washing the motorcycle, precautions must be taken to prevent water from entering the following parts of the motorcycle:

Exhaust: Cover it with a plastic bag tightened with rubber bands.
Clutch and brake levers, hand grips, and engine stop button:
Cover these parts with plastic bags.
Air cleaner intake: Cover the opening with tape or with a rag.

2- Where to be careful

Avoid spraying water with any great force near the following areas:
- Brake calipers and brake pump piston.
- Ignition coil or into the spark plug cap.
- Front and rear wheel hubs.
- Steering bearings.
- Rear suspension system.
- Swingarm bearings

CAUTION

To avoid excessive ageing of the plastic parts and other washable pieces of the motorcycle, it is suggested that these items must be washed carefully. If the washer applies water at high pressure and/or temperature, take the precaution of maintaining the washer outlet gun at a distance of 30 centimeters minimum, this will ensure the correct gloss of the plastics and maintain adherence of the self-adhesive labels that decorate the motorcycle.

3- After washing

- Remove the plastic bags, and clean the air cleaner intake.
- Lubricate the points listed in the lubrication section
- Start the engine and let it run for 5 minutes.
- Check the brakes before operating the motorcycle.

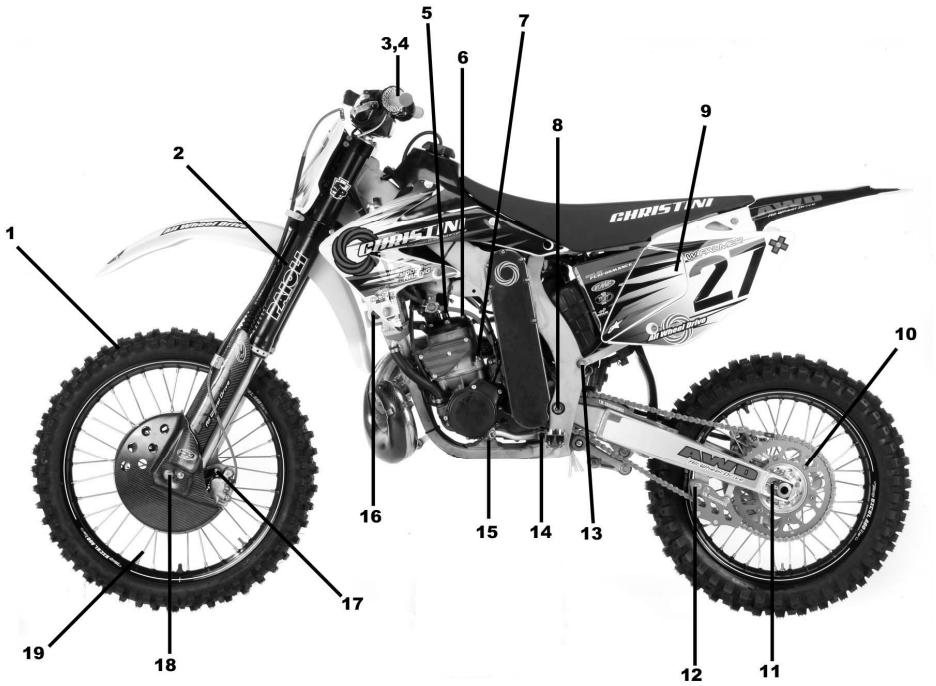
WARNING

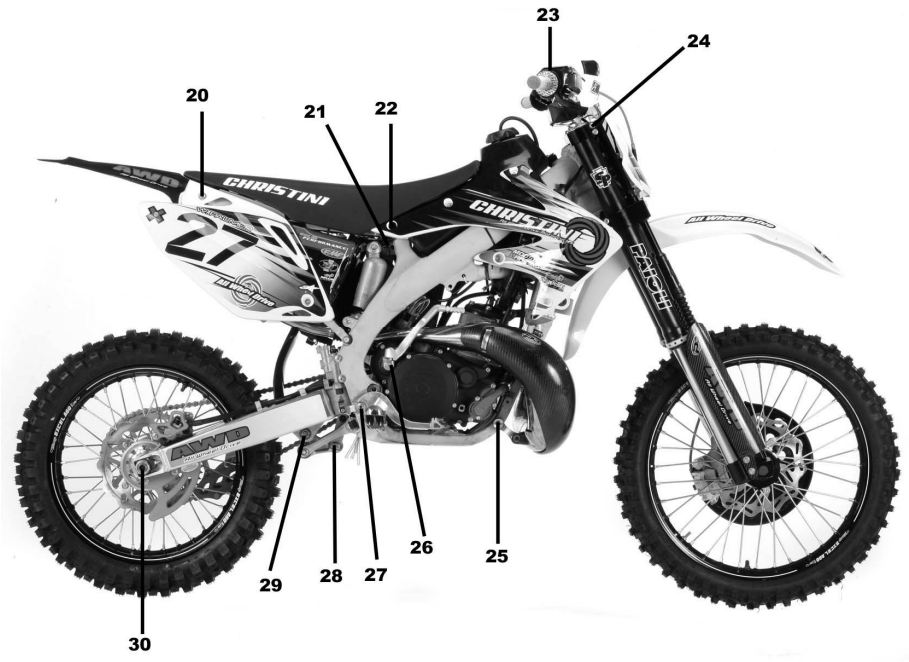
Never wax or lubricate the brake disc. Loss of braking and an accident could result. Clean the disc with trichloroethylene or acetone.

Nut and Bolt Tightening

Before each ride, check the condition of the components below and make sure all bolts and nuts are properly tightened:

1- Front and rear wheel
2- Front fork
3- Handlebar
4- Clutch lever holder screw
5- Spark plug
6- Cylinder head bolt
7- Cylinder nuts
8- Swingarm shaft nut
9- Air box screw
10– Rear sprocket bolts
11– Chain adjuster nut
12– Chain guide bolts
13– Subframe bracket bolts
14- Gearshift pedal bolt
15- Engine holder bolts and nuts
16– Radiator bracket bolts
17– Front caliper bolts
18– Front axle nut
19- Spokes
20– Seat mounting bolts
21– Rear shock bolt
22- Subframe bolts
23– Brake lever bolt
24– Fork pinch bolts
25– Exhaust mounting bolts
26– Kick-start bolt
27- Rear brake pedal bolt
28– Torque rod mounting bolt
29– Linkage mounting bolt
30– Rear axle bolt





Torque Values Table

Tighten all bolts and nuts to the proper torque using an adequate wrench. A bolt or nut loose might damage the motorcycle or even cause an accident.

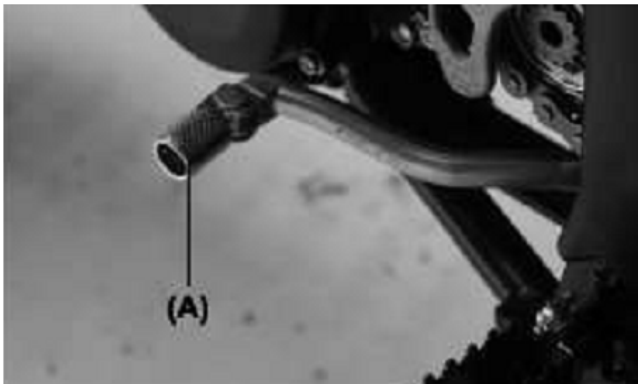
	PART NAME	Nm
FRAME	Brake caliper mounting bolt	25
	Disc mounting screw	10
	Engine mounting bolt	36
	Front axle bolt	51
	Front brake hose mounting bolt	6
	Suspension clamp bolt	15
	Steering nut	98
	Rear axle nut	98
	Rear brake pedal bolt	9
	Subframe bracket bolt	26
	Rear shock absorber bolt	39
	Rear drive plate nut	29
	Spokes	1.5
	Steering stem nut	4
	Torque rod bolt	81
	Rear linkage bolt	81
ENGINE	Cylinder head screws	25
	Cylinder nut	25
	Engine drain plug	20
	Kick-start pedal bolt	20
	Kick-start pedal nut	25
	Gearshift pedal bolt	15
	Spark plug	27
	Water pump cover drain plug	9
	Crankcase screws	10
	Starter pedal plate screw	8
	Ignition motor stator screws	8
	Ignition motor coil nut	40
	Selector spring fixing screw	15
	Primary nut	40
	Clutch spring screws	10
	Valve control support screws	10
	Valve control nuts	8
	Reed valve screws	10
	Thermostat housing screws	10
	Clutch housing screws	10
	Valve housing screws	8
	Ignition housing screws	10
	E-start sproket screws	60
	Bendix cover screws	10
	E-start engine screws	10

LUBRICATION

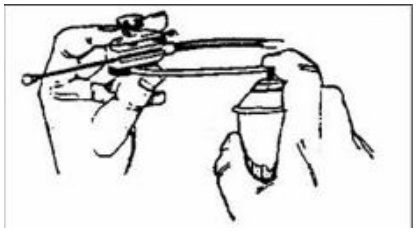
Lubricate the points shown here, apply either engine oil or grease, periodically or whenever the vehicle has been operated under wet or rainy conditions, and especially after using high water pressure. Before lubricating each part, remove any rusty spots with rust remover and wipe off any grease, oil, or dirt.

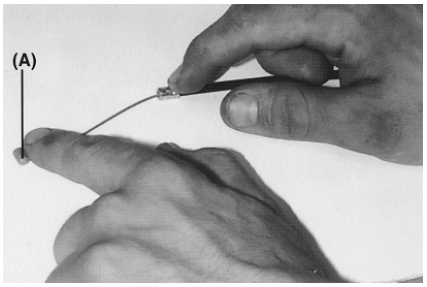
General lubrication:

- Clutch lever (A).
- Front brake lever (B).
- Rear brake pedal (C).
- Rear brake bearing (D).
- Gearshift pedal (E).



Use an aerosol with a tube for pressure lubrication and apply grease inside the gas cable (A).

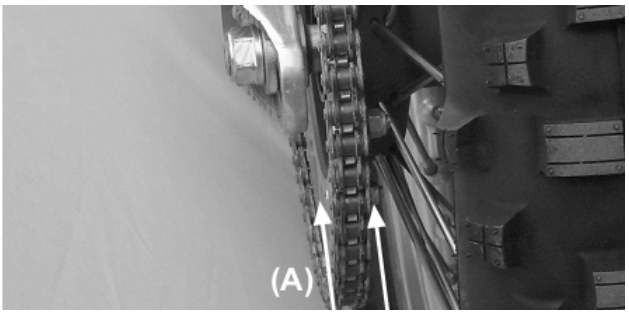




Drive Chain Lubrication

Lubricate the drive chain after driving on wet terrain or when the chain looks dry. A high viscosity oil is preferred rather than a lower viscosity because it will stick to the chain longer and lubricate the chain better.

Apply oil to the sides of the chain rollers (A) for better oil penetration. Wipe off any excess oil.



1. CARBURETOR TUNE-UP

Mixture

First step is to establish a basic knowledge on the identification and operation of carburetor components. Change settings in accordance with the temperature:

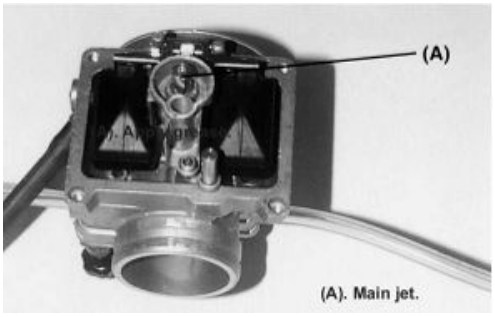
Condition	Mixture	Change setting
Cold air	Lean	Rich
Warm air	Rich	Lean
Dry air	Lean	Rich
Low altitude	Standard	Standard
High altitude	Rich	Lean

NOTE

The main jet should be increased or decreased 1 to 5 sizes and tested until the engine gives maximum power.

Main jet

It has a great overall effect. The number stamped on lower part of the main jet indicates the size of the hole metering fuel. A greater number corresponds to a bigger hole which supplies more fuel.



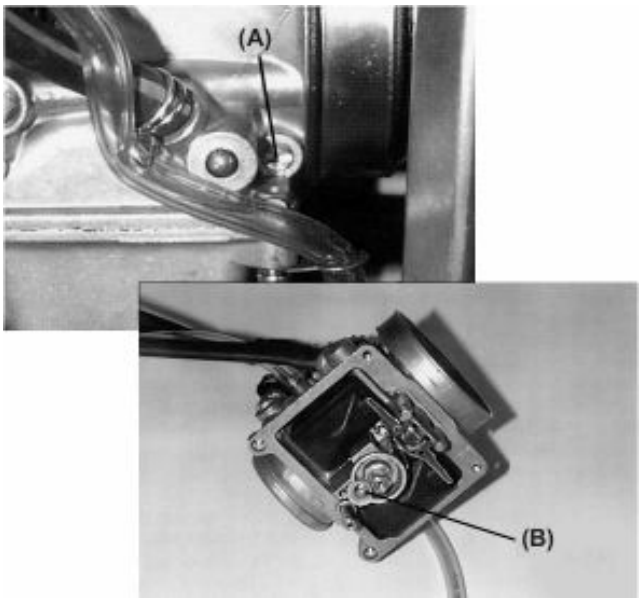
(A). Main jet.

WARNING

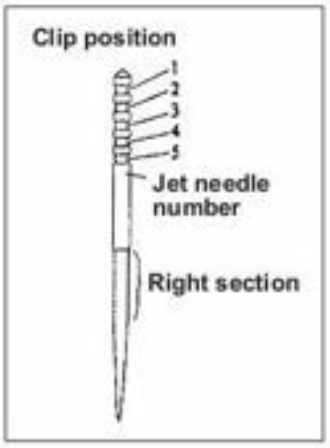
Gasoline is extremely flammable and can be explosive under certain conditions. Always stop the engine and do not smoke. Make sure the area is well ventilated and free from any source of flame or sparks (this includes any appliance with a pilot light).

Idling nozzle and mixture adjustment screw

Controls the mixture from the closed position to an opening of 1/8 of throttle range, but has little effect on full throttle. To adjust the mixture in this range, the air screw can be turned to change the air flow through the circuit, or the slow jet can be changed to provide more or less fuel. Start by turning the air screw. Screwing it in richens the mixture. The air screw must be turned from a lightly seated position. Make changes in 1/2 turn increments. If turning the screw between 1 and 2.5 turns does not give the desired results, change the slow jet (B) one step and tune up with the air screw (A).



Carburetor jet needle



The jet needle and jet needle hole together have their greatest effect in the one-half throttle range. The needle moves in and out of the jet needle hole; since the needle is tapered, its position in the jet determines the amount of fuel allowed to flow. There are five grooves in the upper section of the needle where a circlip fits. This clip locates the needle in the throttle valve and determines its relative position in the jet needle hole, and provides a rich mixture. Moving the clip to the top will provide a lean mixture. Change the clip position one step at a time. The straight area of the needle affects throttle valve response in the small openings range.

Test runs with the motorcycle

- Warm up the engine with the carburetor at the standard setting, and inspect the operating conditions of the spark plug.
- Test-ride the motorcycle with the throttle opened.

Symptoms of improper settings

If your motorcycle exhibits one of the following symptoms the changes must be adjusted. Before attempting any changes, make sure that everything else is in good operating condition.

Check the condition of the spark plug, make sure the ignition timing is correct, service the air cleaner element, decarbonize the exhaust tube.
If your machine has run properly up to this point, it is possible that the problem is elsewhere; changing the carburetor settings in such a case would probably be a waste of time.

Spark plug condition		
Correct	Insulator is dry & light tan color	
Too lean	White color insulator	Replace the main jet to one step larger
Too rich	Insulator is wet & black color	Replace the main jet to one step smaller

- Set the carburetor so that the engine delivers satisfactory power with the throttle valve opened.
- If the air-fuel mixture is too lean, the engine tends to overheat and may be seized. On the other hand, if it is too rich, the spark plug easily gets wet and causes misfires. The proper mixture varies depending on atmospheric conditions. Taking these conditions into consideration, adjust the carburetor settings properly.

NOTE

Keep in mind that the carburetor components that regulate fuel flow and the screw that control the flow of air must be tight.

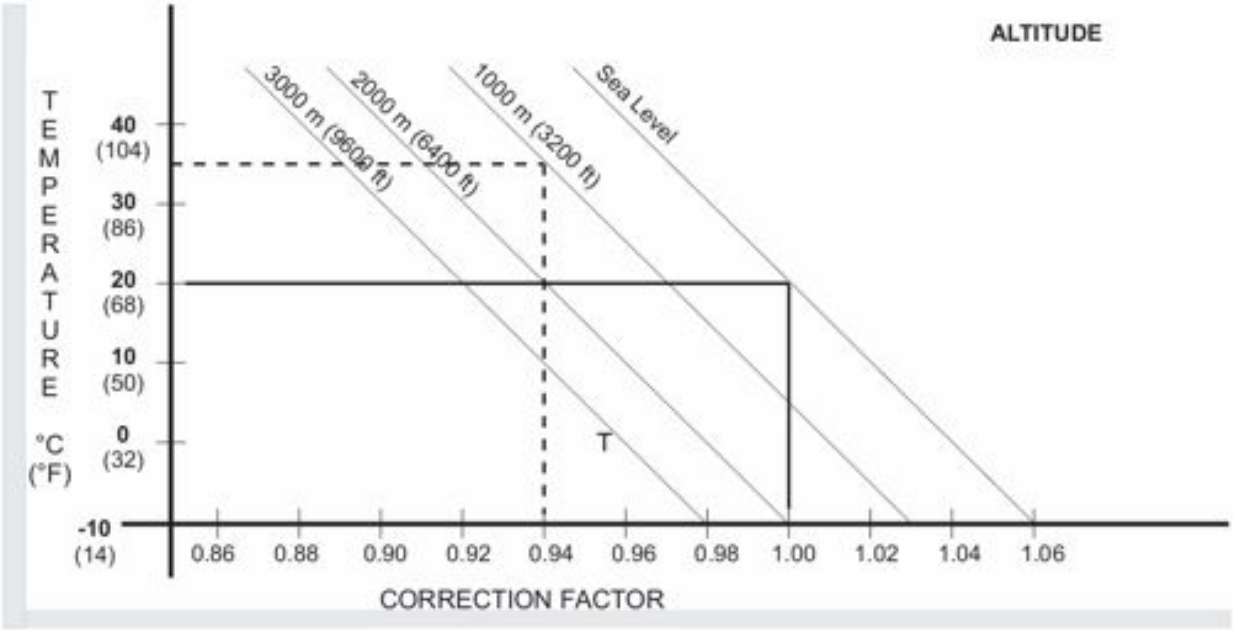
The standard competition measurements EC 250 are an example.

FUEL	UNLEADED
Throttle valve	7
Idle jet	42
Needle	N1EF
Main Jet	180

Correction factors:
(For altitude or temperature changes).
1. Find the correction factor to adjust the carburetor.
Example: 1000 meters altitude with an air temperature of 35°C.
The correction factor is 0.94.
2. Using the correction factor, select the correct slow jet and main jet.
Example: For a correction factor of 0.94 multiply the jet size by that number.
Main jet: # 180 x 0.94 = # 170.
3. Find the correction factor on the Jet Needle / Air Screw chart and change the jet needle clip position and air screw opening as indicated.
- Jet needle clip setting: from the 3rd groove to the 2nd groove.
- Air screw opening: 1 1/2 + 1 turn = 2 1/2 turns out.

NOTE

For the following recommendations to be accurate, you must use the standard settings as a base-line. Also do not change any of the settings until you have determined what changes are necessary. All specifications are based on the use of the fuel and oil specified.



NEEDLE POSITION / AIR SCREW OPENING					
CORRECTION FACTOR	1.06 or HIGHER	1.06 - 1.02	1.02 - 0.98	0.98 - 0.94	0.94 or LOWER
NEEDLE POSITION	LOWER CLIP 1 POSITION	SAME	SAME	SAME	RAISE CLIP 1 POSITION
AIR SCREW OPENING	TIGHTEN 1 TURN	TIGHTEN 1/2 TURN	SAME	LOOSEN 1/2 TURN	LOOSEN 1 TURN

STORAGE

For extended storage of the motorcycle, you must do the following:

- Clean the motorcycle thoroughly.
- Start the engine for about 5 minutes to warm up the transmission oil and then drain it (refer to the transmission section).
- Fill with new transmission oil.
- Empty the fuel tank (gasoline will deteriorate if left too long).
- Disconnect the battery.
- Lubricate the drive chain and all cables.
- Cover all unpainted metal surfaces with a coat of oil to prevent rust, do not apply oil to the brakes and rubber parts.
- Cover the exhaust pipe with a plastic bag to prevent corrosion.
- Place the motorcycle in such a position so that the wheels do not touch the ground (if this is not possible, place cardboards under the wheels).
- Cover the motorcycle to protect it from dust and dirt.

When starting off after an extended storage:

- Remove the plastic bag from the exhaust pipe.
- Tighten the spark plug.
- Fill the fuel tank.
- Check all points marked in the section “Daily Inspection Before Riding”.
- General lubrication.
- Connect the battery.

TROUBLESHOOTING

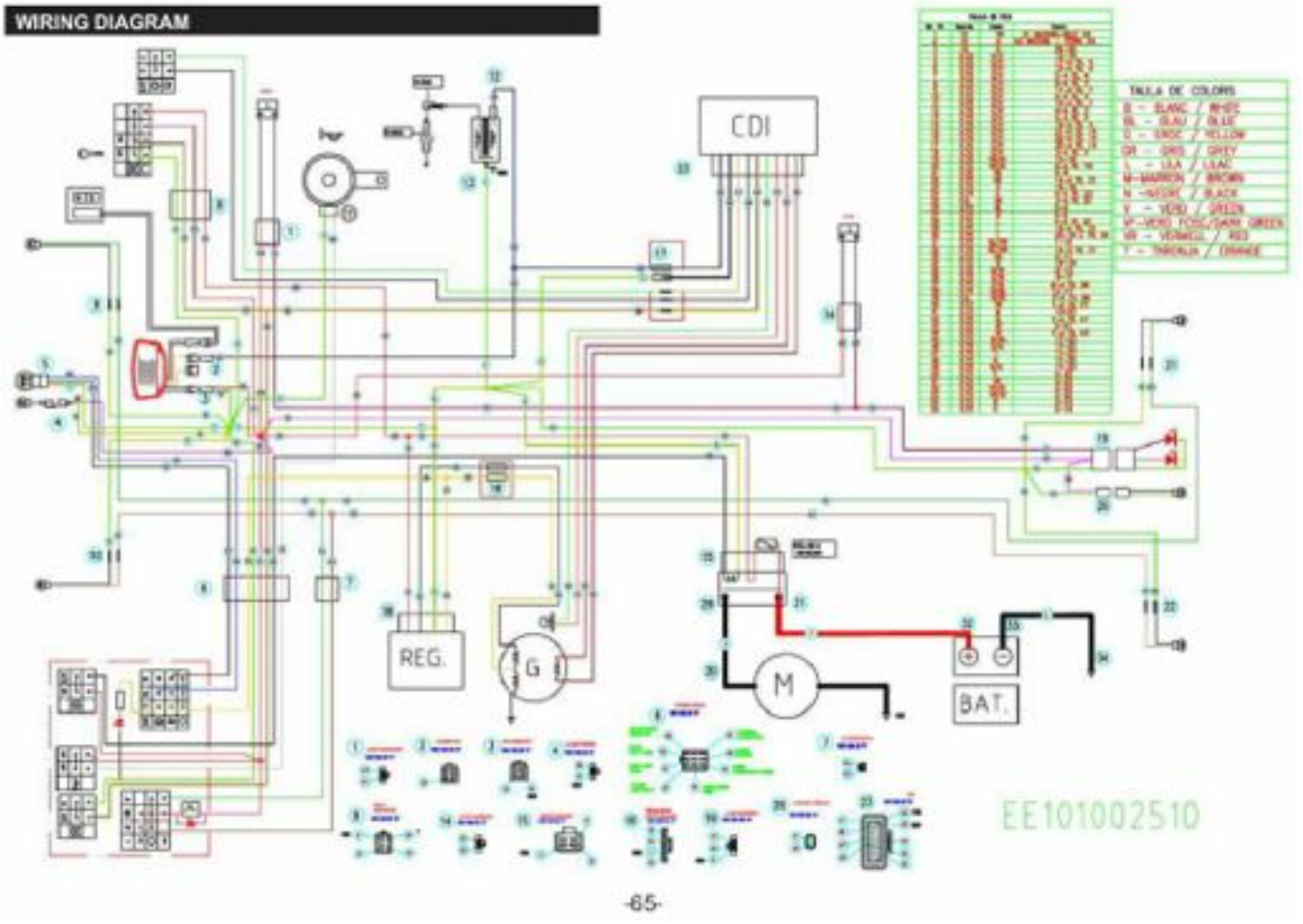
NOTE

This is not an exhaustive list of malfunctions, it only shows the most common problems.

	MALFUNCTION	POSSIBLE CAUSE	REMEDY
1	**Engine does not crank**	- Seized crankshaft. - Seized cylinder / piston / jornal bearing. - Seized transmission assembly. - Motorcycle inactive too long. - Wet or fouled spark plug. - Flooded engine. - Incorrect air/fuel mixture. - Exhaust valve stuck open	- Go to a specialized workshop. - Go to a specialized workshop. - Go to a specialized workshop. Drain old fuel out of the tank. With the fuel tank filled with new fuel, the engine will start immediately. - Clean and dry or replace the spark plug. - In order to "relieve the engine", accelerate to max. speed, press the starter pedal 5 or 10 times. Then, start the engine as described above. If the engine fails to start, remove the spark plug and dry it. - Clean the fuel tank air vent. Adjust the air cleaner duct. - Verify the exhaust valve and repair as necessary.
2	**Engine cranks but then stops**	- Incorrect air supply. - No fuel.	- Close the starter. Clean fuel tank air vent. Adjust the air cleaner duct. - Fill up the fuel tank.
3	**Engine overheating**	- Insufficient cooling liquid in the circuit. - Radiator is dirty or partially restricted.	- Fill up cooling liquid, verify the refrigeration system watertightness. - Clean radiator fins or replace it.
4	**The engine operates irregularly**	- Spark plug dirty, or misadjusted. - Poor contact with the spark plug cap or cable loose in cap.	- Verify the spark plug condition and clean it accordingly, tighten or replace it. - Verify the spark plug cap condition. Replace if deteriorated.
4	**The engine operates irregularly**	- Ignition rotor damaged. - Water in fuel.	- Replace the rotor. - Drain the fuel tank and fill up with new fuel.
5	**Engine lacks power or poor acceleration**	- Fuel supply defective. - Dirty air cleaner. - Leaking or deteriorated exhaust system. - Dirty carburetor jets. - Worn or damaged crankshaft bearings. - Clutch slips.	- Clean the fuel system and verify its operation. - Clean or replace the air cleaner. Verify its operation. - Verify if the exhaust system is damaged. Replace the muffler fiberglass packing, if necessary. - Disassembly the carburetor and clean all jets. - Replace the crankshaft bearings. - Verify the clutch operation. Go to a specialized workshop.
6	**Abnormal engine noise**	- Ignition problem. - Overheating.	- Go to a specialized workshop. - Refer to section 5.
7	**Detonations from the exhaust pipe**	- Carbon build up in combustion chamber. - Incorrect octane or poor quality gasoline. - Damaged spark plug or incorrect specifications. - Deteriorated exhaust system gaskets.	- Clean the combustion chamber. - Drain all gasoline and fill up with a higher octane fuel. - Replace the spark plug with a new one of the correct type. - Verify if the exhaust system is damaged. All gaskets must be in perfect conditions, otherwise replace them with new ones if necessary.
8	**White smoke coming out of the exhaust pipe**	- Deteriorated cylinder head gasket (water leakage into the cylinder). - Incorrect throttle valve cable adjustment.	- Replace the cylinder head gasket. Go to a specialized workshop. - Readjust the throttle valve cable.
9	**Brown smoke coming out of the exhaust pipe**	- Restricted air cleaner. - Main jet set too high.	- Clean or replace the air cleaner. Go to a specialized workshop. - Verify main jet operation. Go to a specialized workshop.

	MALFUNCTION	POSSIBLE CAUSE	REMEDY
10	**Gears do not engage correctly**	- Clutch does not disengage. - Bent or seized shift fork. - Gear seized at the transmission. - Damaged gearshift lever. - Broken or loose selector position spring. - Broken spring in the reverse selector mechanism. - Broken spring in the reverse selector mechanism. - Broken gear drum. - Broken spring in the gear selector ratchet.	- Go to a specialized workshop. - Replace the shift fork. - Go to a specialized workshop. - Replace the gearshift lever. - Adjust or replace the selector position spring. - Replace the spring in the reverse selector mechanism. - Replace the spring in the reverse selector mechanism. - Replace the gear drum. - Replace the spring in the gear selector ratchet.
11	**Jumps out of gear**	- Shift fork worn at the gears. - Worn gear grooves. - Worn gear dogs. - Worn shift drum groove. - Worn shift fork shaft. - Broken selector drum position spring. - Broken gears.	- Replace the shift fork. - Replace. Go to a specialized workshop. - Replace. Go to a specialized workshop. - Replace. Go to a specialized workshop. - Replace shaft. Go to a specialized workshop. - Replace the spring. Go to a specialized workshop. - Go to a specialized workshop.
12	**Clutch slips**	- No clutch lever free play. - Worn clutch friction plate. - Worn clutch center hub. - Broken or weak clutch spring. - Unevenly worn clutch discs.	- Go to a specialized workshop. - Replace the clutch friction plate. Go to a specialized workshop. - Replace the clutch center hub. - Adjust or replace the clutch spring. - Replace the clutch discs. Go to a specialized workshop.
13	**The motorcycle is unstable**	- Cable interferes with the handlebar turns. - Steering stem locknut too tight. - Damaged or worn steering bearings. - Bent steering stem.	- Move or loosen the cable just a little. - Loosen the steering stem locknut. - Replace the steering bearings. - Replace the steering stem. Go to a specialized workshop.
14	**Shock absorber set too hard**	- Excessive front fork oil. - Front fork oil viscosity too high. - Bent front fork. - Tire air pressure set too high. - Incorrect rear shock absorber adjustment.	- Pour excess oil until reaching the correct oil level. - Drain fork oil and fill with correct fork oil viscosity. - Replace the front fork. Go to a specialized workshop. - Check tire air pressure. - Adjust rear shock absorber.
15	**Shock absorber set too soft**	- Insufficient front fork oil. - Front fork oil viscosity too low. - Bent front fork. - Tire air pressure too low. - Incorrect rear shock absorber adjustment.	- Fill with fork oil until reaching the correct oil level. - Drain fork oil and fill with correct fork oil viscosity. - Replace the front fork. Go to a specialized workshop. - Check tire air pressure. - Adjust the rear shock absorber.
16	**Abnormal motorcycle noises**	- Incorrect drive chain adjustment . - Worn drive chain. - Worn rear sprocket teeth. - Insufficient drive chain lubrication . - Incorrect rear wheel alignment. - Insufficient front fork oil. - Weak or broken front fork spring. - Worn disc brake. - Pad installed incorrectly or surface glazed. - Damaged cylinder. - Improperly tightened brackets, nuts, bolts.	- Adjust the drive chain. - Replace the drive chain, rear sprocket and the secondary transmission pinion. - Replace the rear sprocket. - Lubricate with appropriate chain oil. - Align the rear wheel. Go to a specialized workshop. - Add front fork oil until reaching the correct level. - Replace the front fork spring. - Change the disc brake. - Reinstall or replace pad. - Replace the damaged cylinder. - Verify and adjust to the correct torque values.
17	**Handlebar vibration**	- Worn tire, and worn swingarm or its needle bearings. - Wheel rim off-centre. - Incorrect wheel alignment.	- Replace worn parts with new ones. - Centre rim. - Verify wheel spokes tension. Readjust if necessary.

	MALFUNCTION	POSSIBLE CAUSE	REMEDY
17	**Handlebar vibration**	- Excessive steering axles tolerances. - Loose handlebar bracket, and loose handlebar stem locknut.	- Tighten steering bracket and steering stem locknut to the correct torque values. - Tighten steering bracket and steering stem locknut to the correct torque values.
18	**Motorcycle pull to one side**	- Bent chassis. - Incorrect steering adjustment. - Bent steering stem. - Bent front fork. - Incorrect wheel alignment.	- Replace the chassis. Go to a specialized workshop. - Adjust the steering. Go to a specialized workshop. - Replace the steering stem. Go to a specialized workshop. - Replace the front fork. - Align the wheels.
19	**Brakes do not operate correctly**	- Worn discs. - Leaking brake fluid. - Deteriorated brake fluid. - Broken pump piston. - Incorrect brake adjustment.	- Replace the discs. - Verify the brake circuits. Replace the damaged or broken parts. - Drain the brake fluid and fill with the new fluid recommended by the manufacturer. - Replace the pump piston. - Adjust brakes.
20	**Blown light bulbs**	- Voltage regulator faulty.	- Remove the seat and the fuel tank, and check all connections, check the voltage regulator and the fuses in the fuse box .
21	**Lighting system does not operate**	- Blown lighting relay fuse.	- Remove the seat, the fuse box cover, and replace the fuse.


WIRING DIAGRAM
CDI
REG.
G
M
BAT.
EE101002510
-65-

AWD Service Section

The Tools You Will Need for Maintenance

- Socket set, metric
- Pliers set
- Ball peen/ dead blow hammers
- Soft tip metal punch (brass/aluminum)
- Screw driver set
- AWD clutch wrench (optional)
- Open ended wrenches, metric
- Allen key set, metric
- Snap ring pliers, 45 or 90 degree
- Bearing punch set
- Blind side bearing removal kit (Motion Pro 08-0292)
- 2 large adjustable wrenches
- Torque wrench 0-75 ft-lbs
- Split bearing puller
- Small pick or awe
- Safety wire pliers
- Safety wire .032”
- Grease gun (included with bike purchase, customer must supply grease below)
- Shell Albida EP1 Lithium grease (do not substitute)
- Spectro SPL grease or equivalent
- Blue Loctite #242
- Red Loctite #262
- Green Loctite #609

Headtube Gearbox
Preload Bars
Top Triple Clamp
Bottom Triple Clamp
Clutch Assembly
Linear Bearing Housing
Main Gearbox (behind Sidebar)
Spline Shaft Bellows
Sidebar Cover
Shaft Sprocket
AWD Hub
Dropout

- Do not adjust the choke while the bike is moving!
- Do not over tighten the front axle as it can damage the inside Axle Clamp Bearings.
- Do not engage the AWD system while at high speeds. Disengagement of the AWD system can occur at any speed.
- Be cautious when power washing bike, especially around front drive hubs and AWD seals. Spraying high pressure water into these areas can damage seals and bearings.

Pre-ride check list:

- Check secondary AWD chain tension.
- Lube secondary AWD chain.
- Check clutch setting (see “AWD Clutch Test” section).
- Check front wheel for proper function (see “Front Wheel Sprag Test” section)
- Check front wheel rim lock nut torque.

As Needed

- Replace bearings if excessive noise or friction develops.
- Lubricate spline shafts through grease port with supplied grease gun and Shell grease.
- Replace worn or damaged seals and boots.

AVOID:

- Pressure washing the dropouts, head tube area, side bar and main gearbox.

AWD Clutch Test

- Place the bike on a stand and make sure that the front wheel is not touching the ground.

- Shift the bike into gear.

- Turn the AWD switch to the on position and check to make sure the AWD is engaged.

- Grab the front wheel with two hands and try to spin it backwards. The front wheel should spin backwards but require a large amount of effort to do so. If the wheel will not break free, the clutch is set too high. If the wheel turns backwards very easily, the clutch is set too low.

- If the clutch needs to be adjusted, pull the gas tank off the bike.

- Loosen the set screw on the clutch locknut.

- Turn the locknut in or out a 1/2 turn at a time until the front wheel moves backward with the correct amount of force. To keep driveshaft from spinning apply front brake.

- Make sure the set screw is positioned over a flat in the clutch hub and tighten the set screw down and reinstall the tank.

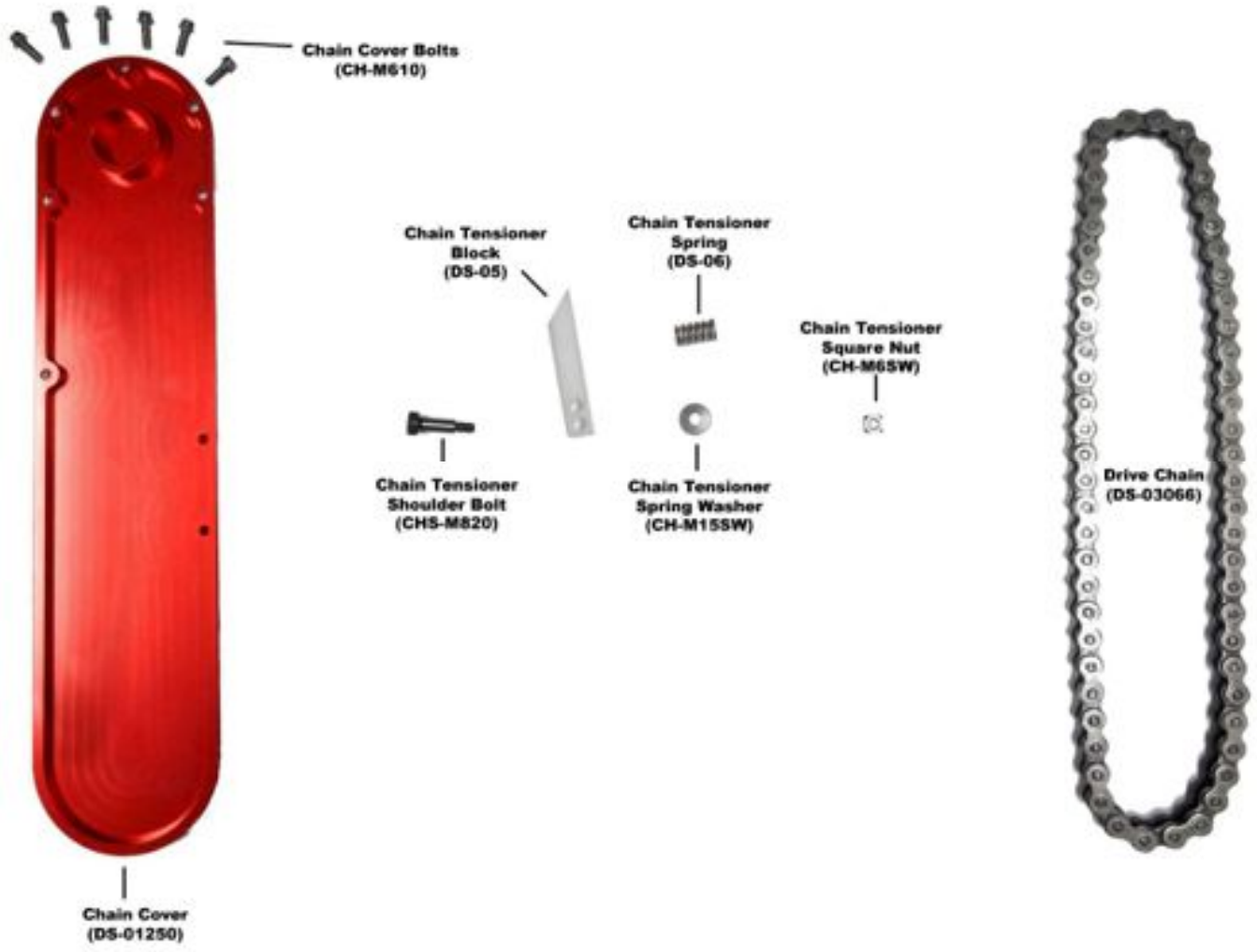
Front Wheel Sprag Test

Note: Before performing this test, make sure the AWD Clutch is set correctly.

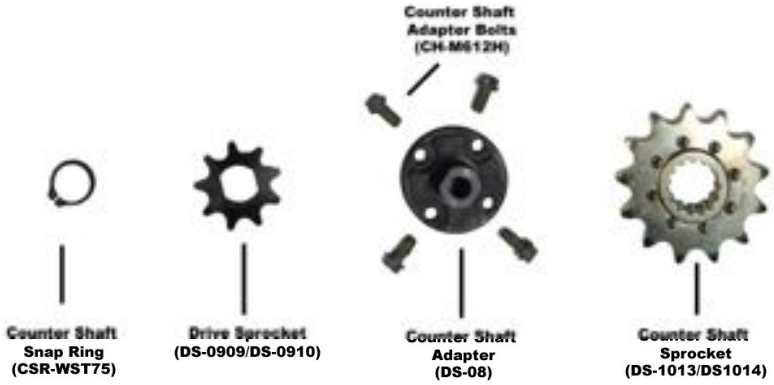
- Place the bike on a stand and make sure that the wheels are not touching the ground.
- Turn the AWD switch to the on position and check to make sure the AWD is engaged.
- Center the handlebars.

- Hold down the front and rear brakes.
- Turn handlebars to the **left** and back to center. There should be steering resistance from the AWD system when this is performed.
- Release brakes and center handlebars.
- Hold down front and rear brakes again and turn handlebars to the **right** and back to center. There should be steering resistance from the AWD system.

- If no resistance is felt, or there is only resistance in one direction, check the front wheel to ensure the sprag bearings are not slipping or damaged. See “Front Wheel Service” section.


Chain Cover Bolts
(CH-M610)
Chain Tensioner
Block
(DS-05)
Chain Tensioner
Spring
(DS-06)
Chain Tensioner
Square Nut
(CH-M6SW)
Chain Tensioner
Shoulder Bolt
(CHS-M820)
Chain Tensioner
Spring Washer
(CH-M15SW)
Drive Chain
(DS-03066)
Chain Cover
(DS-01250)

Chain Cover Bearing
(CB-6804)
External Engagement
Hub Snap Ring
(CSR-17B)
Engagement Spline
Hub
(DS-04)
Side Bar
Seal
(CS-32424)
To Chain Cover
To Side Bar
Chain Cover Seal
(CS-24324)
Engagement Hub Sprocket
(DS-0515/DS-0516)
Internal Engagment
Hub Snap Ring
(CSR-148)
Chain Cover
Bearing
(CB-6905)


Counter Shaft
Adapter Bolts
(CH-M612H)
Counter Shaft
Snap Ring
(CSR-WST75)
Drive Sprocket
(DS-0909/DS-0910)
Counter Shaft
Adapter
(DS-08)
Counter Shaft
Sprocket
(DS-1013/DS1014)

Cover and Chain Removal

- Remove the 6 cover bolts with an 8mm socket or t-handle and pull cover off of the frame.

- To remove the chain, pull the tensioner back with a flat blade screwdriver and pull the sprocket out with fingers or non-marring pliers. Remove the chain from countershaft sprocket.

- Check the following and replace if needed:

    1. Sidebar bearing and cover bearing should be smooth turning.
    2. Check engagement spline action by engaging and disengaging switch on handle bars.
    3. Sidebar seal and cover seal for wear.
    4. Excessive wear on chain tension block.

    Warning: Do not use an O-ring chain as there is not enough clearance for one and it would rub the frame.

- Reinstall chain and top sprocket.
- Adjust chain tensioner using a 4mm Allen wrench and by sliding the tensioner up the sidebar until the front side of the chain has roughly 10-15mm (0.4-0.6in) of give when pressure is applied.
- Replace chain cover. Torque sidebar cover bolts to 8 ft-lb.

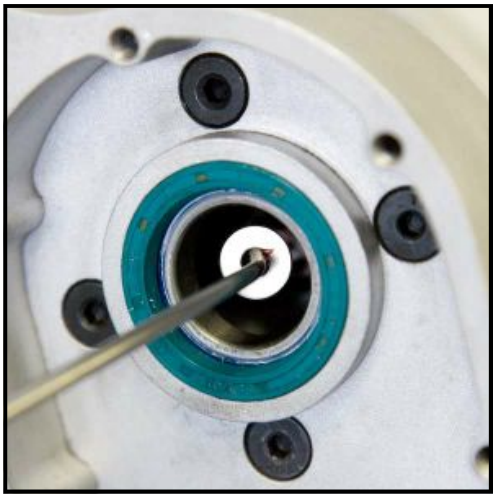
  Note: If cover does not seat on the sidebar, the top sprocket is not fully seated in the bearing.

AWD Engagement Cable
(GB-09)
Engagement Spring
(GB-06)
Engagement Spline Bearing
(CB-685)
Engagement Spring Retaining Washer
(CHW-M6RW)
Engagement Spline
(GB-04)
Cable Fitting
(GB-11)

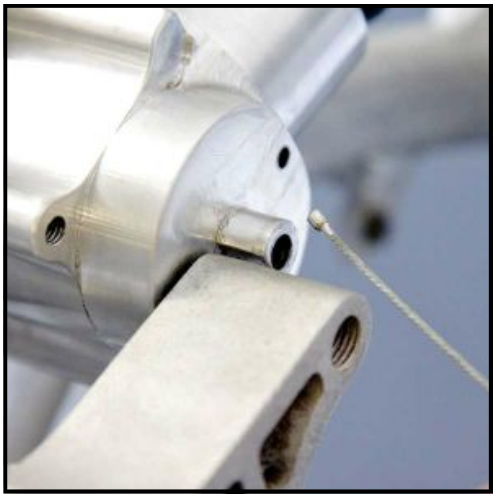
AWD Engagement Switch
(GB-10)

- Grease engagement retaining washer.

- Insert washer into the back of the gearbox using a pick so it sits flush against the input gear retaining ring.

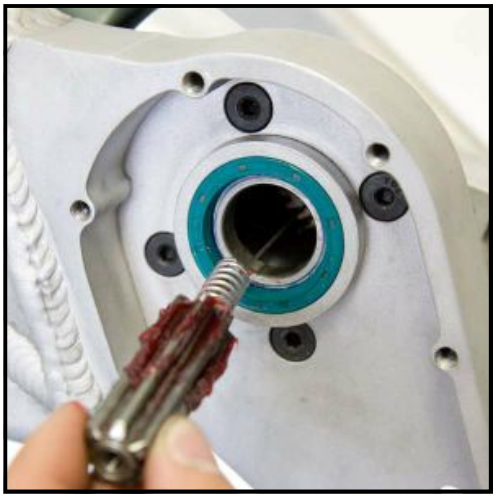


- Insert the small fitting from the engagement cable through the center hole in the back of the gearbox and feed it through until it sticks out the front of the sidebar.



- Grease the engagement spring and spline.

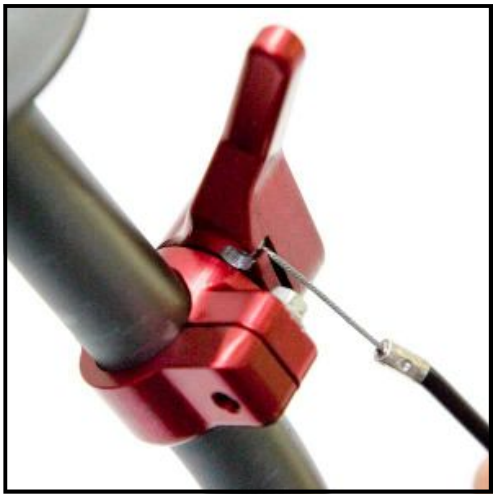
- Feed the engagement cable through the spring and spline.



- Insert the cable fitting onto the end of the cable and seat the fitting into the engagement spline bearing.

- Seat the cable housing into the back of the gearbox.

- Slide the other end of the cable into the engagement switch.



- Line up the engagement spline with the input gear inside the gear-box and push the spline into the gear.

- Position the switch so the lever is positioned towards the rider (on) and slide the housing into the end of the switch.

Note: If there is not enough slack to seat the cable, make sure the engagement spline is pushed all the way into the gearbox and the barrel adjuster on the cable is turned in completely.

- Insert the secondary sprocket into the sidebar and make sure it is fully seated.

- Position the engagement lever towards the rider (on) and turn the barrel adjuster out until the engagement spline just starts to pull away from the stop snap ring.

- Push the lever to the off position. Make sure the secondary sprocket is fully seated. Spin the secondary sprocket to verify that the spline has fully disengaged from the sprocket and it spins freely.

Note: Due to AWD hub design, front wheel removal and installation is aided by removing front caliper first.

- Remove front brake caliper (note: do not squeeze front brake lever while caliper is off.
- Remove axle bolt from axle.

- Loosen axle pinch bolts on both sides of dropout.

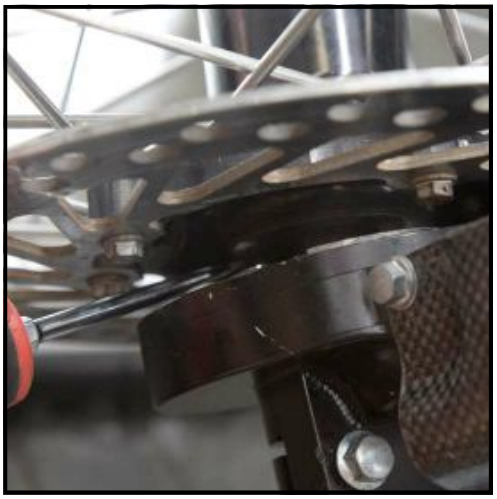
- Slide axle through wheel and remove.

- Remove front wheel from dropouts.

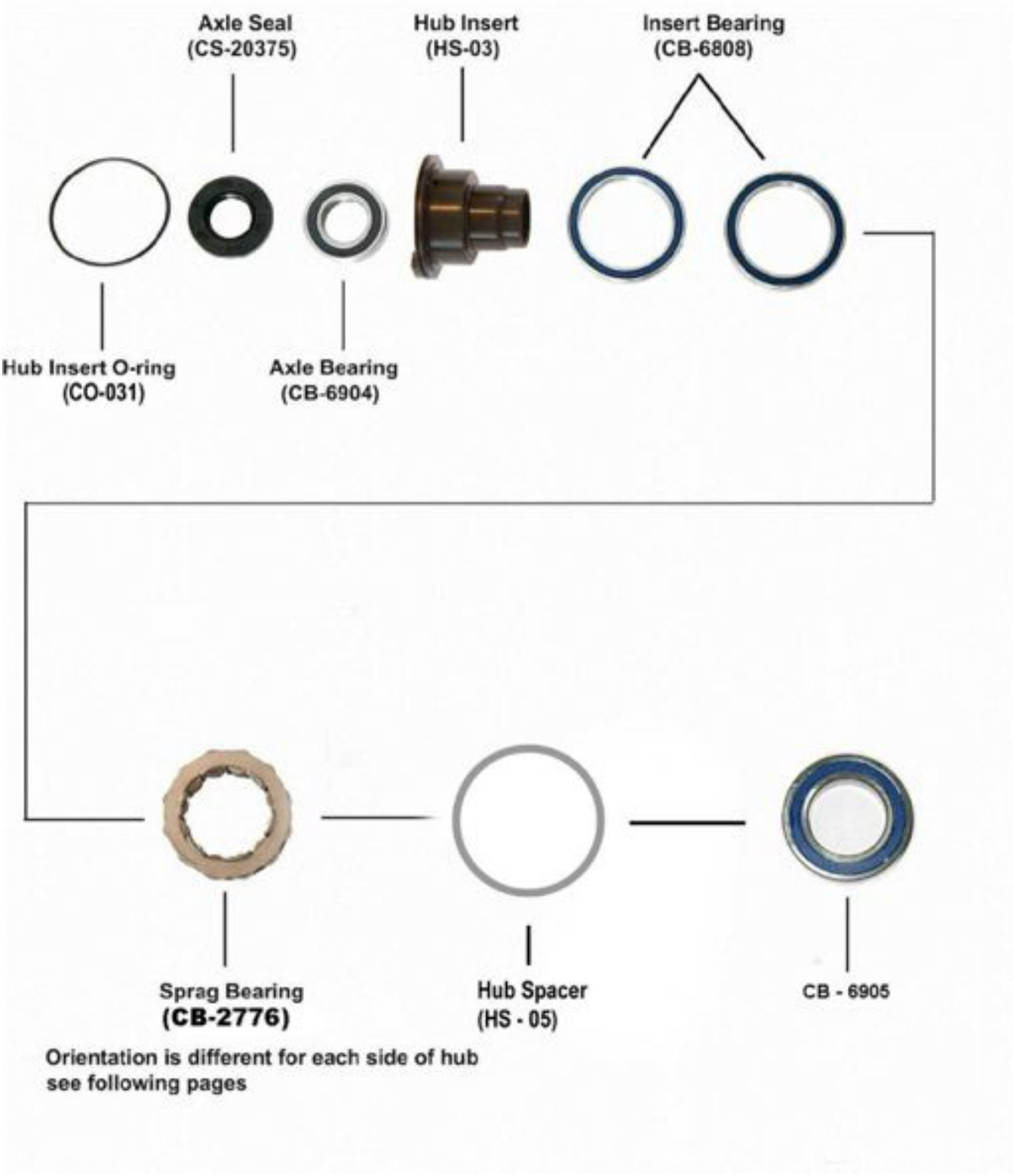
Note: The hub inserts will not fall out like the spacers on a normal hub. They will also rotate independent of each other; this is ok.

Front Wheel Installation

- Lightly grease dropout o-rings and hub seals before installing the front wheel.
- With brake caliper removed, install front wheel into forks by carefully aligning right drive carrier on dropouts with hub inserts. Once the right carriers are seated, slide axle through to other end of hub.
- Carefully align left carriers and slide axle completely through to the other side. Note, a flat blade screw may be needed to align hub insert with drive carrier. Note that the hub inserts will only rotate in one direction in the hub.



- Thread axle bolt back into the end of axle and tighten to 12ft-lb. Tighten axle pinch bolts to 12 ft-lb. **Note:** If wheel does not spin freely, axle bolt is too tight!
- Reinstall front brake caliper.

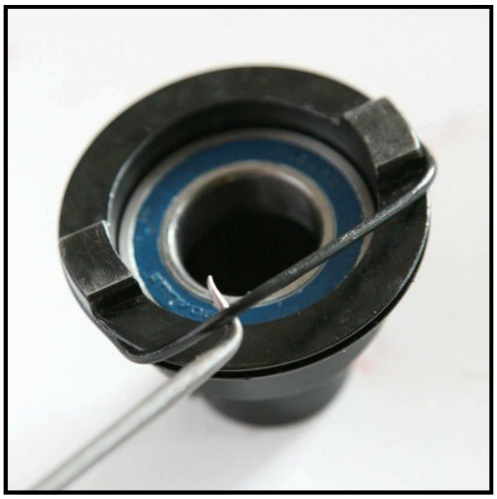

Axle Seal
(CS-20375)
Hub Insert
(HS-03)
Insert Bearing
(CB-6808)
Hub Insert O-ring
(CO-031)
Axle Bearing
(CB-6904)
Sprag Bearing
(CB-2776)
Hub Spacer
(HS - 05)
CB - 6905
Orientation is different for each side of hub
see following pages

Warning: Before taking hub apart, make sure that you have a full set of spare sprag bearings. Sprag bearings are likely to be damaged during the disassembly process and new ones may be required.

- Using a soft punch, remove the hub inserts from either side of the hub.

- Pry the insert seals out of the inserts using a flat bladed screwdriver.

- Remove the hub insert o-rings with a pick.



- Punch the axle bearings out of the inserts using the access holes in the back of the inserts.

- Using a bearing punch, install the axle bearings into the hub inserts.

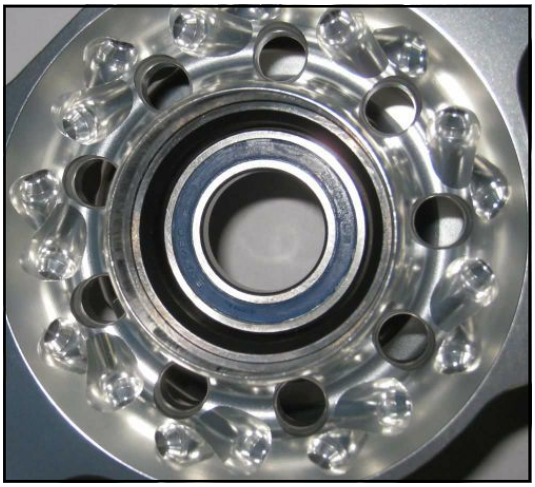
- Press the axle seals into the hub inserts.

- Install the hub insert o-rings.

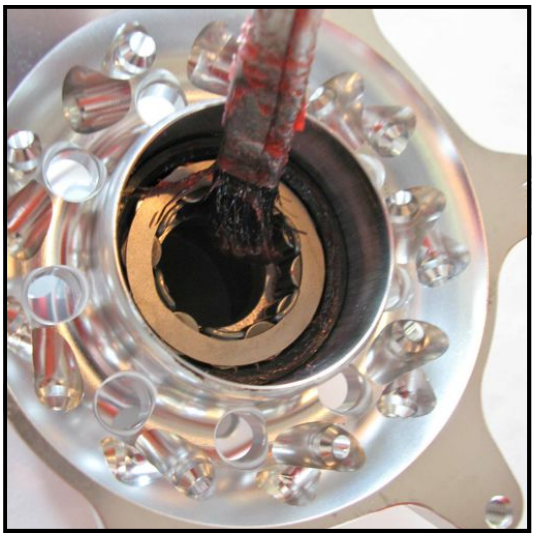
Warning: Sprag bearings must be installed in the correct orientation in the hub for the AWD system to work properly. If the sprag bearings are not installed correctly, the AWD system can be damaged.

- Press CB-6905 bearing into the Hub Inner Race

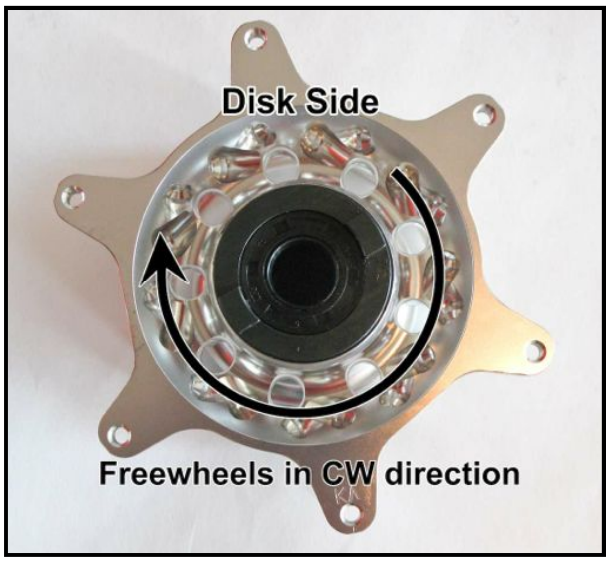
- Be sure that the bearing is seated completely



- Insert sprag bearing into hub shell. (correct direction will be determined in next steps.). Lightly grease inside of sprag bearing with Shell grease.



- Test fit hub insert into hub, twisting as it is inserted.



- **Spin the hub insert and check to make sure it is freewheeling in the correct direction.** If it is not, remove the hub insert and flip the sprag bearing around. Recheck to verify that hub insert freewheels in the correct direction before moving on to next step.

- Remove hub insert and press insert bearings into hub.

- Grease hub insert seal, and slip hub insert into hub. It may be required to tap hub insert into hub with a soft faced hammer.

-
- Grease axle seal.

- Repeat procedure for the other side of hub.

Fork Removal

Warning: If removing forks for rebuild service, the fork dropouts must be disassembled so that the drive system parts are not contaminated during the service.

- Loosen the housing cap from the linear bearing housing and un-screw it completely

- Slide the housing down off the sprocket driveshaft

- Looser top and bottom triple clamp bolts. Be sure to hold fork while loosening bolts so it does not fall out. Slide fork out of triple clamps and remove.

Warning—When fork is off the bike do not apply side pressure to spline shafts as it is possible to bend them if enough force is applied.

- Carefully slide forks into triple clamps.

- Set desired fork height and torque triple clamp bolts to the following:

  15 ft-lbs Lower

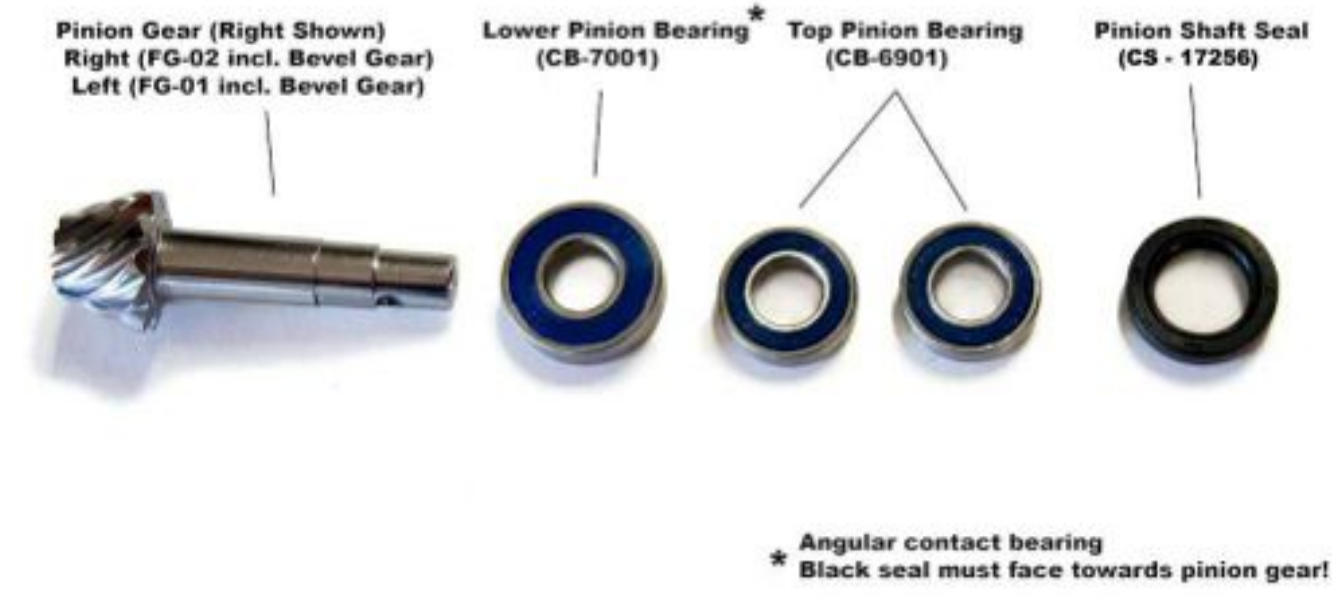
  17ft-lbs Upper

- Slide the linear bearing housing over the drive sprocket shaft

- Tighten the housing cap down with 2 adjustable wrenches

-

Drive Carrier Bolts
(CH-M62OH)
Drive Carrier Axle O-Ring
(CO-019)
Drive Carrier
(FG-03)
Drive Carrier O-Ring
(CO - 030)
External Cover O-ring
(CO - BL - 035)
Internal Cover O-Ring
(CO - 042)
Cover Bolts
(CH-M612H)
Dropout Cover
(FP-10)
Cover Bearing
(CB-6808)
Bevel Gear (Right Shown)
Right (FG-02 incl. pinion)
Left (FG-01 incl. pinion)
Drive Insert
(FG-04)
Drive Insert Bearing
(CB-6807)


Pinion Gear (Right Shown)
Right (FG-02 incl. Bevel Gear)
Left (FG-01 incl. Bevel Gear)
Lower Pinion Bearing*
(CB-7001)
Top Pinion Bearing
(CB-6901)
Pinion Shaft Seal
(CS - 17256)
* Angular contact bearing
Black seal must face towards pinion gear!

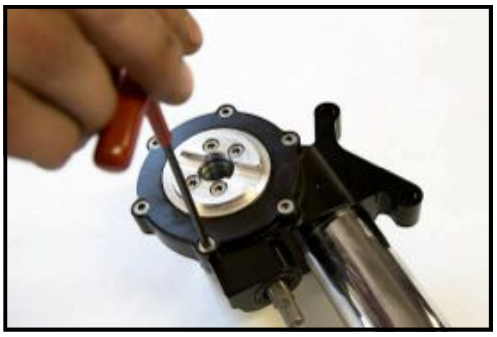
- Remove the front wheel and front fork.

- Remove bellow clamp and bellow from spline driveshaft. Pry gently with small flathead screw driver to undo clasp on clamp. The clamps are not reusable!

- Remove set screw from driveshaft with 2.5mm Allen key.

- Remove driveshaft from pinion gear by lightly tapping lower driveshaft with a plastic hammer while pulling the driveshaft away from the dropout.

- Remove 6 cover bolts on the outside of the gearbox using a 4mm Allen wrench.



- Rotate the cover and pull it off of the dropout.

Dropout Service

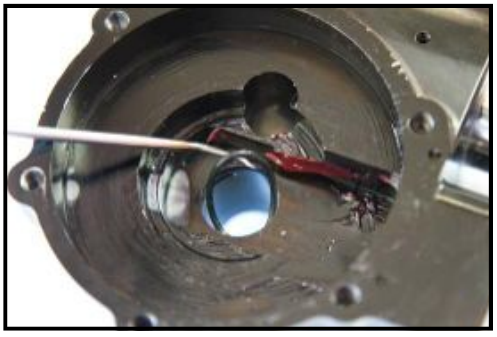
- Remove drive insert bearing from inside of dropout. Bearing is a slip fit so only light pressure from screw driver is required to remove.

- Tap down on pinion gear with plastic face hammer. After pinion is removed, slide the bottom bearing out of dropout bore. If bearing stays on pinion shaft, remove by hand or with split bearing puller. Note: lower pinion bearing is angular contact so if pressure is applied in the wrong direction it may come apart. If bearing comes apart, it must be replaced.

- Remove top driveshaft seal from dropout using small flat blade screwdriver. Be careful not to scratch inner bore.

- Remove top pinion bearings from upper bore by tapping them lightly tapping from inside the dropout with non-marring punch.

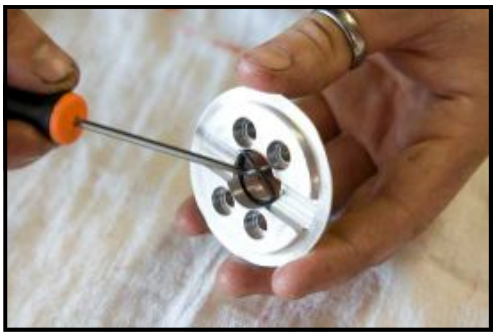
- Pry axle o-ring from dropout using small pick.



- Remove 4 drive carrier bolts with 4mm Allen wrench. The inner hardened bevel gear can be clamped with soft jaws in a vise or the drive carrier can be held with square bar stock to keep the assembly from moving as you unscrew the bolts.

- Lightly tap the outside face of drive carrier with plastic hammer to break it free from gear and drive insert.

- Remove axle o-ring from drive carrier with pick.



- Remove cover o-rings and drive carrier o-ring.

Dropout Service

- Remove cover bearing with bearing removal punch. Note o-ring lip near inner race of bearing is easily damaged. Only apply pressure to inner race of bearing.

- Remove drive insert from gear with hammer and bearing removal tool.

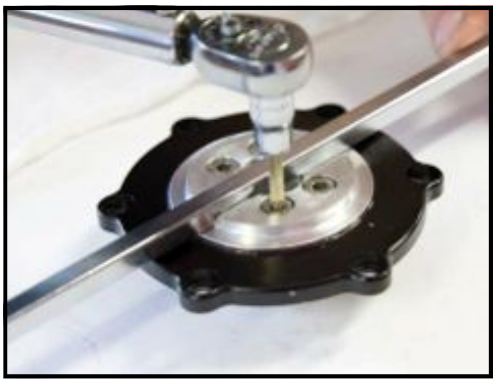
- Before reassembly of dropouts, all parts must be cleaned and inspected individually for damage or wear. Parts can be cleaned with solution no different then OEM fork. Be sure to blow dry dropouts and parts prior to reassembly if cleaning solution is used.
- Pinion and bevel gear must be replaced as a set.
- If bearings are seized or hard to turn by hand they must be replaced or cleaned and repacked with grease.
- Be sure to grease all o-rings and gears during reassembly.

- Install cover bearing into cover with bearing installation tools.
- Install internal and external cover O-rings. **Note:** all O-rings should be lightly coated with grease before being reassembled.

- Insert drive carrier o-ring on drive carrier and insert drive carrier into cover and tap into place. **Note:** face of drive carrier should be flush with cover bearing and machined cover surface.

- Place drive insert on tooth side of bevel gear and line up all four threaded holes with clearance holes on gear.

- Set cover and drive carrier on top of bevel gear assembly, with smooth side of gear facing the cover. Line up 4 bolt holes and thread drive carrier bolts into drive insert. Blue Loctite should be used on bolts. Final tightening of bolts will require a square bar or soft jaws to keep gear from spinning. Torque bolts to 8ft ft-lbs.
- Check that bevel gear spins freely on cover. If it does not spin freely, check to make sure all o-rings and the cover bearing are properly seated. If new o-rings are used, there may be more friction until o-rings seat and break in.
- Insert axle o-ring into drive carrier.



Dropout Service

Warning: Bevel gears are right and left hand specific and must be installed in the correct dropout or damage to the system can occur. The Left Bevel Gear Set shown below must go in the disk side dropout. Note the difference in the spiral direction on each gear set.

Right Bevel Gear Set
(FG-02)

Left Bevel Gear Set
(FG-01)

Note: Be sure dropout is clean before proceeding

- Insert top pinion bearings and seal into driveshaft bore at top of dropout using bearing driver. Note, be careful not to damage seal or nick chrome fork plating with hammer. Use plastic faced hammer.
- Apply light grease to pinion seal

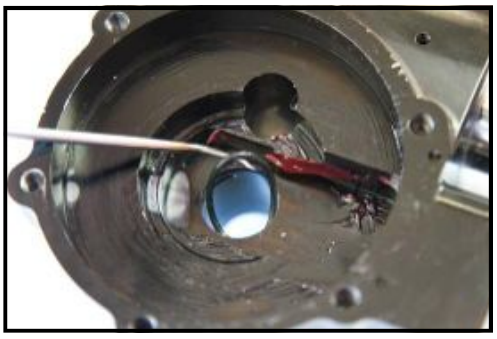
- Insert bottom pinion bearing onto pinion gear.

WARNING: black seal must be facing down towards gear teeth. If bearing is not inserted correctly, severe damage can occur!

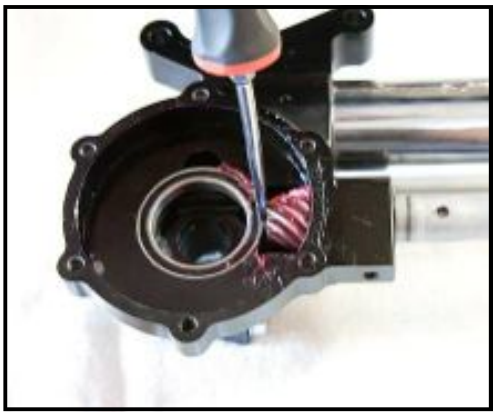
- Slide bearing and pinion gear into bore. Make sure bearing is fully seated.

- If needed use hammer and soft punch to tap end of pinion gear to seat bearing.

- Insert axle o-ring into dropout.



- Install drive insert bearing and wedge small flat blade screwdriver in between pinion gear and inner bearing to keep pinion gear in place when the splined shaft is installed.



- Slide splined driveshaft onto pinion gear, making sure to line up the set screw holes. Lightly tap end of spline shaft with plastic faced hammer to slide it down onto pinion gear and line up set screw holes.

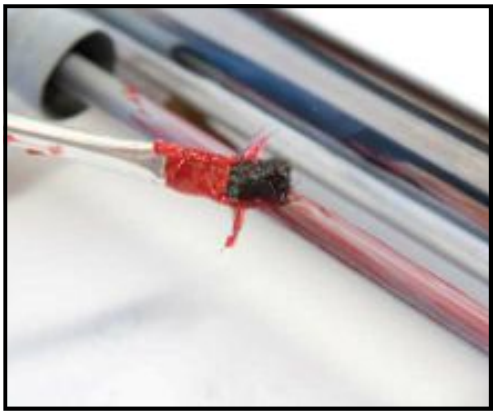
- Insert set screw with light dab of blue Loctite. When set screw is fully seated, it will be slightly below the surface of driveshaft. If not, make sure that spline shaft is fully seated on pinion gear.

- Grease pinion gear and bevel gear with Shell Lithium grease.
- Insert cover/bevel gear assembly onto dropout.
- Insert 6 cover bolts and tighten in a cross star pattern using a 4mm Allen wrench. Tighten to 8ft-lbs.
- Check that drive carrier spins freely and wipe excess grease from outside of dropout.

- Reinsert bellow and bellow clamp over spline shaft and crimp bellow down using crimping tool or vise grips.

WARNING: The band of clamp must be over the set screw to ensure that the set screw can not back out.

- Lightly grease spline shaft with Shell Lithium grease.



- Reinsert forks into triple clamps.

Sleave Seal
(CS-050)
Housing Sleeve
(FD-09)
Grease Fitting
(FD-11)
Retaining Ring
(CSR-81B)
Housing Felt
(FD-10)
Linear Bearing
(CB-LSAG12)
Housing Cap
(FD-08)
Cap O-ring
(CO-116)
Cap Snap Ring
(CSR-75B)
Linear Bearing Housing
(FD-07)

- Cut Safety wire from boot and slide it off the housing.

- Remove forks from triple clamps (see “Fork Removal” section).

- Slide housing assembly off of linear driveshaft.

- Unscrew grease port from linear bearing housing.
- Remove set screw from housing.

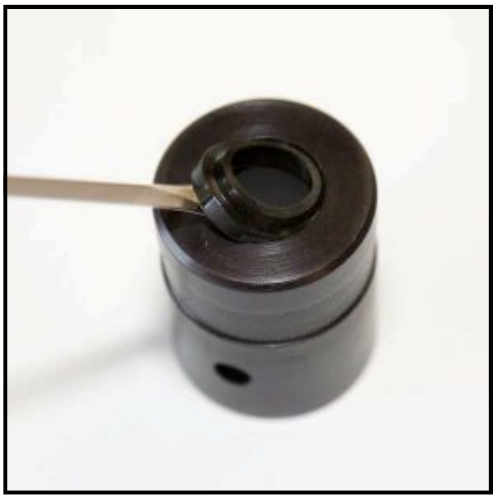
- Slide housing sleeve off of housing.

- Remove linear bearing retaining ring.

- Slide linear bearing out of housing and inspect. If ball bearings inside of the case are corroded or worn, replace linear bearing.

Warning: Do not use hammer and punch to remove bearing as it may damage the bearing. If bearing will not slide out apply pressure to the bearing lip with an 8mm nut driver to remove it.

- If shaft seal is damaged or worn, pry it out and replace it with a new seal.



- Remove felt from housing sleeve and inspect. If needed, replace felt.

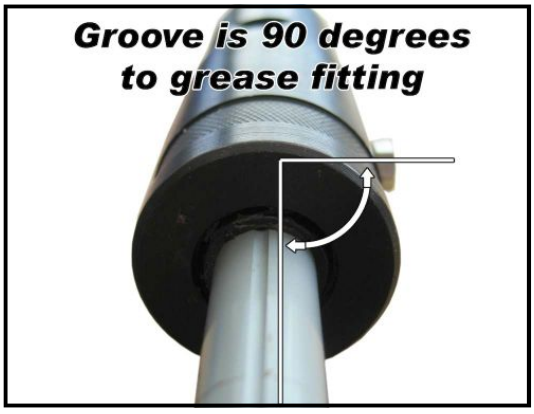
Note: Dirt will pack up in felt. The felt can be cleaned and reused.

- Saturate felt with gear oil and place it back in housing sleeve.

- Reassembly of linear bearing housing is the reverse of disassembly.

Warning: Use red Loctite on grease fitting or it may back out and cause the housing sleeve to slide down while riding.

Warning: When sliding linear bearing housing back unto driveshaft, carefully align the ball bearings with the grooves in the driveshaft. Do not force the housing onto the driveshaft. Groove should be approximately 90 degrees to the grease fitting.



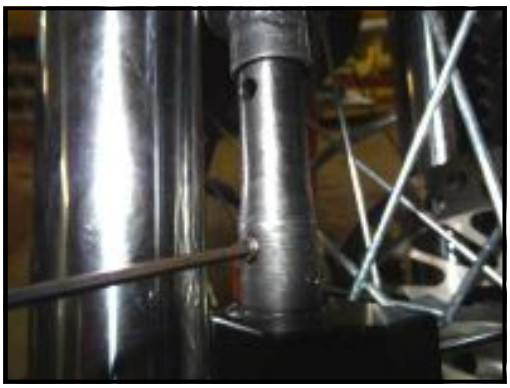
Boot Replacement

Note: To remove and replace the drive shaft boots, it is not necessary to remove the forks. The service can be done by removing the fork guards and following the instructions below.

- Remove Fork Guard

- Remove upper and lower boot clips with wire cutters

- Pull up boot and loosen drive shaft set screw



- Insert screw drive in vent holes and tap up on screwdriver.

- Slide shaft upwards. **Note: Do not slide shaft down and remove from linear bearing.**

- Remove old boot and slide new boot onto driveshaft.

- Add a new clip on the bottom of the shaft.
- Insert driveshaft onto pinion gear and tighten set screw.
- Slide boot over bottom section of shaft and install set screw.

- Crimp the clamp around the boot and set screw.

- Pull top of boot over linear bearing housing and secure with low profile zip tie.
- Reinstall the fork guard.

Triple Clamp Removal

Note: To service the triple clamp chains, sprockets and bearings it is recommended that you leave the bottom triple clamp attached to the bike. This will make it easier to pull the cover off. For servicing the steerer tube bearings, or replacing the head tube gears, the triple clamps will need to be removed.

- Remove forks and front fender from triple clamps.

- Loosen the two preload bar pinch bolts.

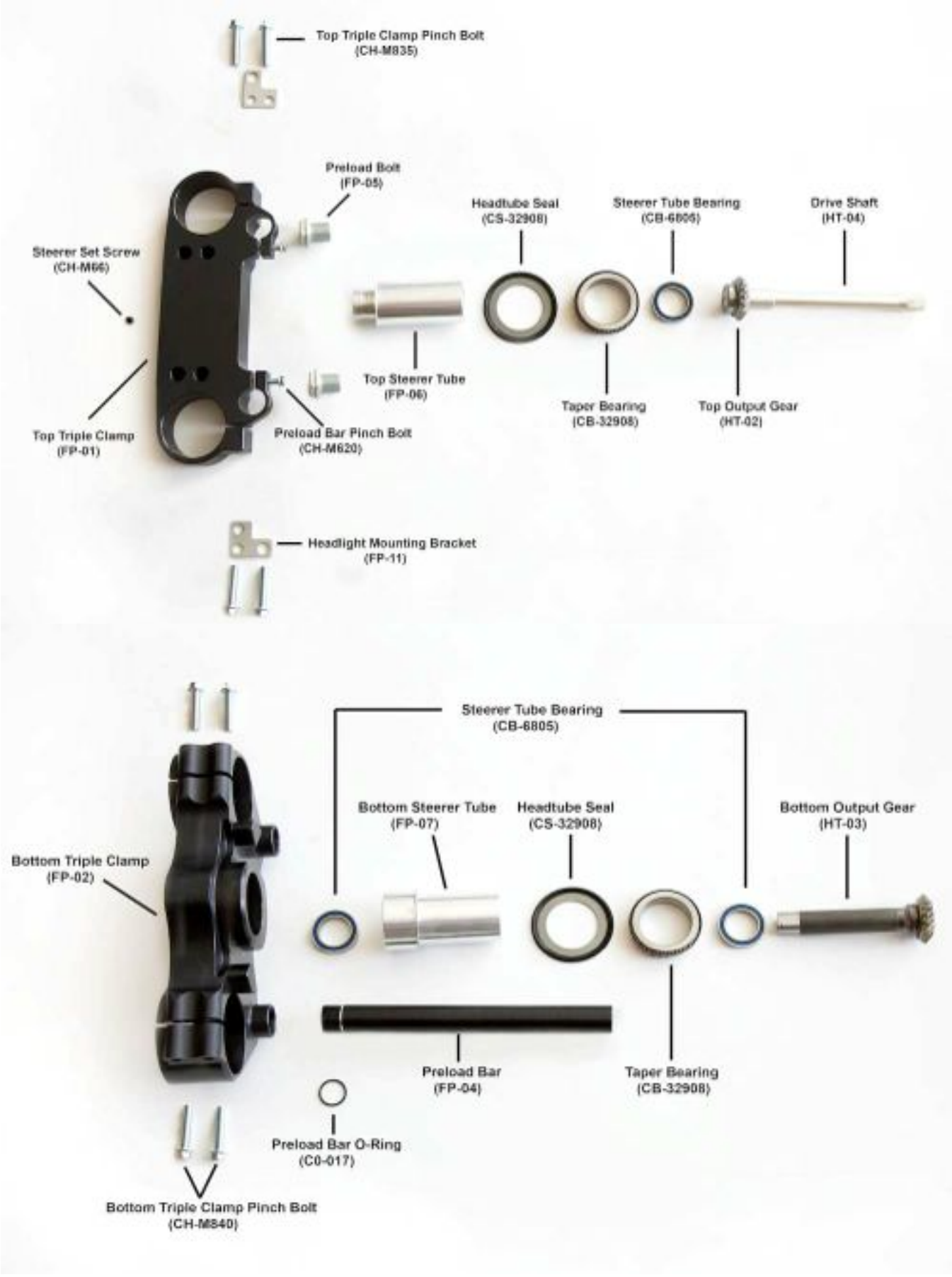
- Remove the preload bolts with a 22mm Wrench.

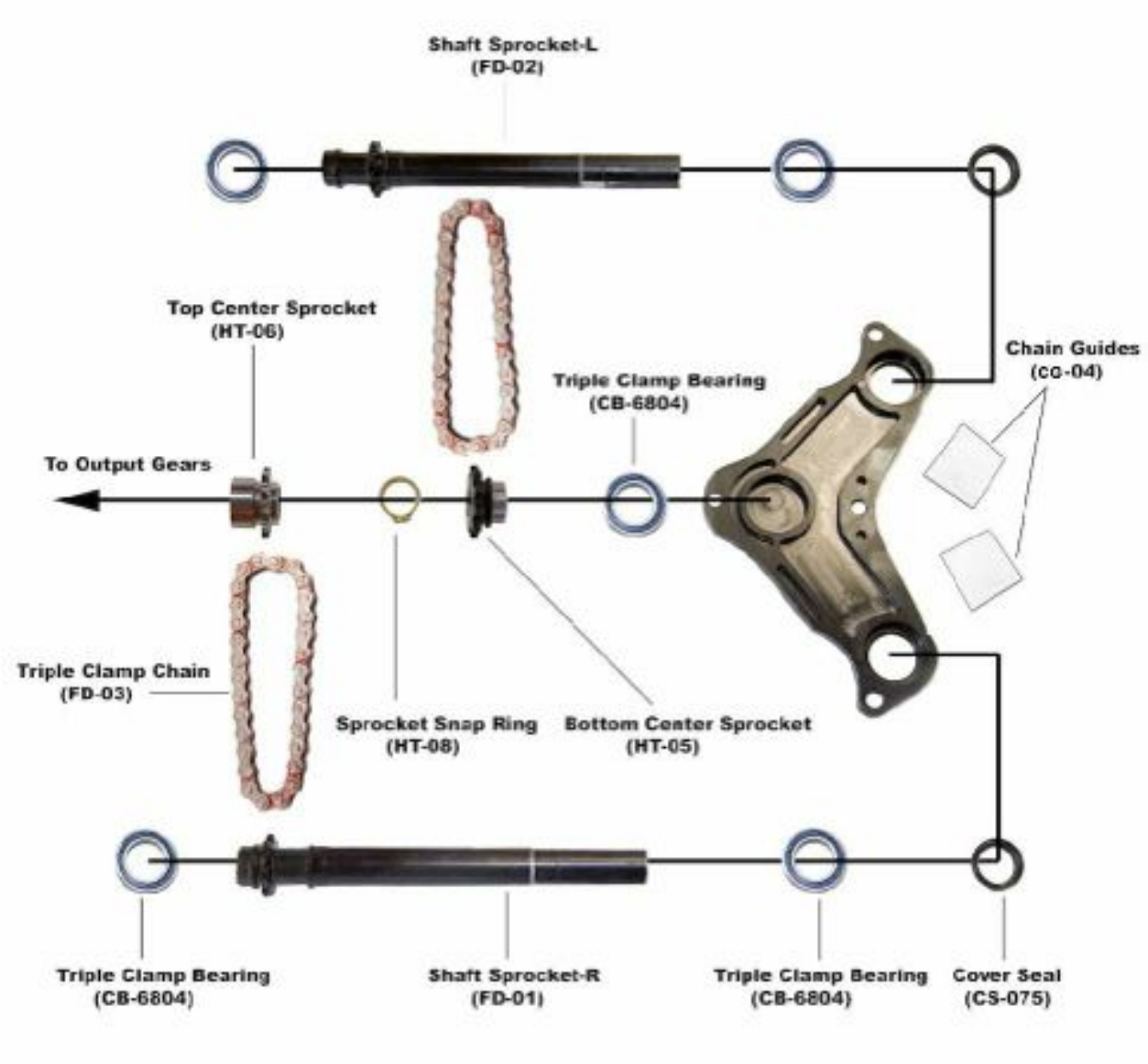
- With a plastic faced hammer, tap the bottom triple clamp to unseat it from the frame.

- Slide the bottom triple clamp out of the frame.

- Pull the top triple clamp assembly out of the frame.

Note: It may be necessary to tap the underside of the top triple clamp with a plastic faced hammer to unseat it from the frame.

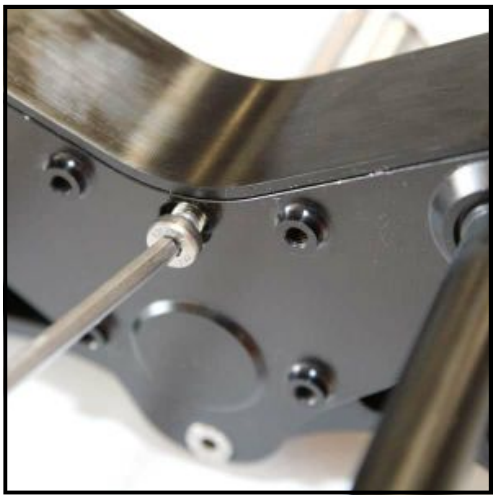

Top Triple Clamp Pinch Bolt
(CH-M835)
Preload Bolt
(FP-05)
Steerer Set Screw
(CH-M66)
Headtube Seal
(CS-32908)
Steerer Tube Bearing
(CB-6805)
Drive Shaft
(HT-04)
Top Steerer Tube
(FP-06)
Taper Bearing
(CB-32908)
Top Output Gear
(HT-02)
Top Triple Clamp
(FP-01)
Preload Bar Pinch Bolt
(CH-M620)
Headlight Mounting Bracket
(FP-11)
Steerer Tube Bearing
(CB-6805)
Bottom Steerer Tube
(FP-07)
Headtube Seal
(CS-32908)
Bottom Output Gear
(HT-03)
Bottom Triple Clamp
(FP-02)
Preload Bar
(FP-04)
Taper Bearing
(CB-32908)
Preload Bar O-Ring
(C0-017)
Bottom Triple Clamp Pinch Bolt
(CH-M840)


Shaft Sprocket-L
(FD-02)
Top Center Sprocket
(HT-06)
Triple Clamp Bearing
(CB-6804)
Chain Guides
(CG-04)
To Output Gears
Triple Clamp Chain
(FD-03)
Sprocket Snap Ring
(HT-08)
Bottom Center Sprocket
(HT-05)
Triple Clamp Bearing
(CB-6804)
Shaft Sprocket-R
(FD-01)
Triple Clamp Bearing
(CB-6804)
Cover Seal
(CS-075)

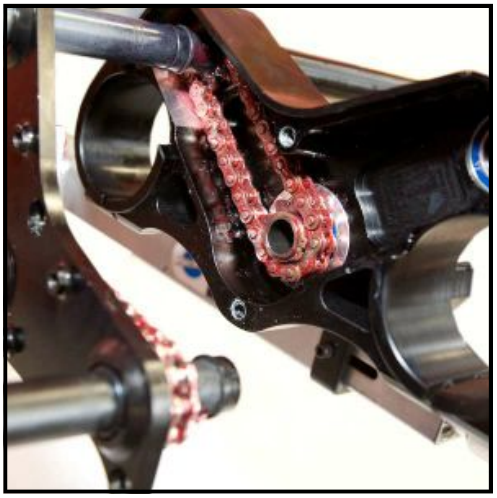
Triple Clamp Service

Note: To service the triple clamp chains, sprockets and bearings it is recommended that you leave the bottom triple clamp attached to the bike. This will make it easier to pull the cover off. For servicing the steerer tube bearings, or replacing the head tube gears, the triple clamps will need to be removed. For picture clarity, the triple clamp was removed from the bike.

- Remove the forks and spline bearing assembly.
- Remove the 4 cover bolts from the bottom of the triple clamp with a 6mm Allen wrench.



- Carefully pull on the shaft sprockets and ease the cover down from the bottom triple clamp. The Left shaft will pull down with the cover. The right shaft will stay in place and the cover will slide down over it.



- Remove the right shaft sprocket and the chain inside of triple clamp cavity.

- Pull center bottom sprocket off of the cover and remove the chain.

- Pull both shaft sprockets out of cover. Be careful of seal as it slides over snap ring grooves as it can tear the seal.

- Remove cover bearings from cover with bearing puller if they need to be replaced.

- Remove cover seals and inspect. Replace if needed.

- Remove sprocket snap ring .

- Remove sprocket and gear by tapping the gear through the sprocket with a plastic faced hammer and pulling it out the top of the steerer tube.

- Remove gear from steerer tube. If bearing comes out with gear, remove bearing from gear with split bearing puller if it does not slide off easily.

- If top bearing remains in steerer use a punch to remove it.

- Tap the bottom output bearing from the bottom steerer tube.

- Inspect gears and bearing and replace any parts if needed.

Note: Head tube gears must be replaced in sets.

Warning: Replacing the taper bearing is a job for your dealer. Do not attempt to do this on your own.

- Remove the preload bars from the bottom triple clamp.

- Press the steerer tube out of the bottom triple clamp with an arbor or hydraulic press. The steering stops should be supporting the triple clamp as the steerer is pressed out.

- Press the taper bearing and seal off of steerer tube with an aluminum sleeve available from Christini.
- Press new taper bearing and seal onto steerer tube.
- Coat mating surface of triple clamp and steerer tube with green Loctite.
- Press steer tube into triple clamp.

- Press steerer bearing into the top of the steerer tube.

- Press steerer bearing into bottom of the steerer tube.

- Install bottom output gear and tap sprocket back onto bottom of gear using a plastic faced hammer. Sprocket is fully seated when the end of it is flush with the snap ring groove.

- Replace snap ring.

- Install cover seals.

- Press cover bearings back into outer bores of cover.

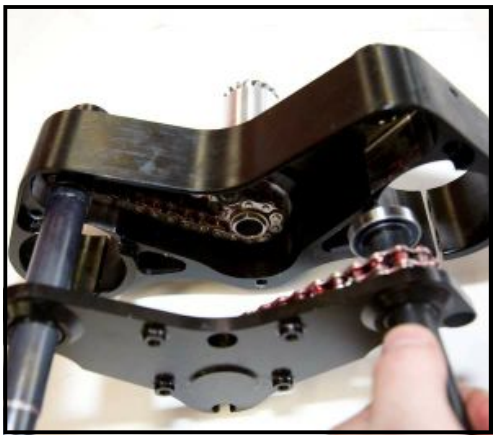
- Insert Teflon chain guides into cover if they were removed. Note the wear pattern and be sure that the guides are placed on the same side as they were removed from.

- Insert triple clamp bearing onto top of the right shaft sprocket. It will be a slip fit.
- Wrap chain around top center sprocket and right shaft sprocket.
- insert shaft sprocket and bearing into bearing bore on triple clamp. It will be a slip fit.

- Insert triple clamp bearing onto bottom center sprocket.
- Push left shaft sprocket through cover.
- Wrap the chain around the left shaft sprocket and bottom center sprocket.
- Insert bottom center sprocket with bearing into the center cover hole.
- If needed, grease chains with Shell grease.

- Slide cover and left shaft sprocket up into bottom triple clamp until the cover meets flush the lip of the bottom triple clamp. If needed use a small screwdriver or pick to push the right chain away from the Teflon block as the cover slides into place.

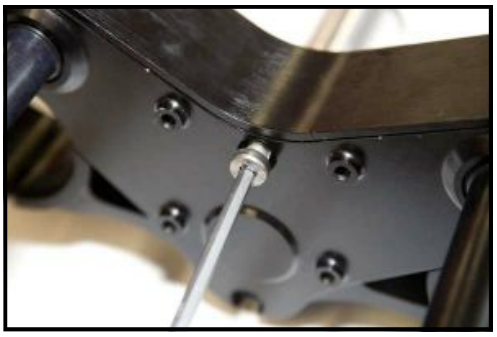
Hint: once the cover makes contact with the bottom triple clamp, rotate the shaft sprockets as you are pushing the cover into its final position. This helps to line everything up correctly.



Warning: Left and right shaft sprockets must be installed on the correct side or severe damage to the AWD system can occur. A simple rule to remember is that the lower shaft sprocket goes on the rider's left side (ie: Left=Low).

- When cover is in place screw down the cover bolts with a 6mm Allen wrench.

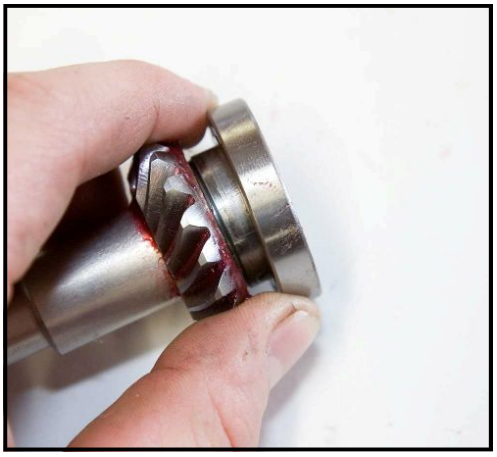
Note: Use blue Loctite on cover bolts. Torque bolts to 12 ft-lbs



- Pull top output gear and bearing out of top steerer. If bearing does not come out with gear, use blindside bearing puller to remove the bearing

- If bearing is seized or hard to turn by hand, it should be replaced.

- Inspect output gear for wear. If it needs to be replaced, **all gears in the head tube must be replaced at the same time.**



Warning: Replacing the taper bearing is a job for your dealer. Do not attempt to do this on your own.

- Loosen steerer set screw in triple clamp and remove the steerer tube.

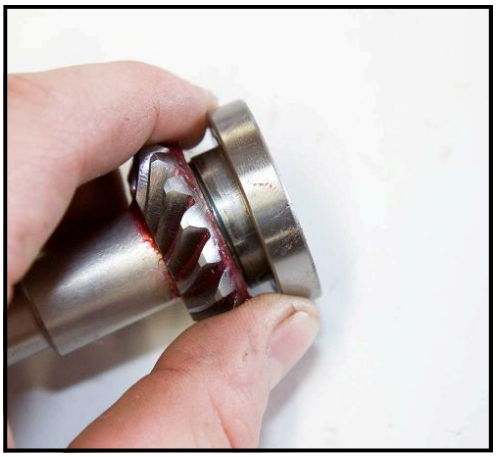
- Press taper bearing and seal off of steerer tube with an arbor or hydraulic press.

Note: A new seal will be needed as it will be damaged when the taper bearing is pressed off the steerer.

- Press new taper bearing and seal onto steerer tube.

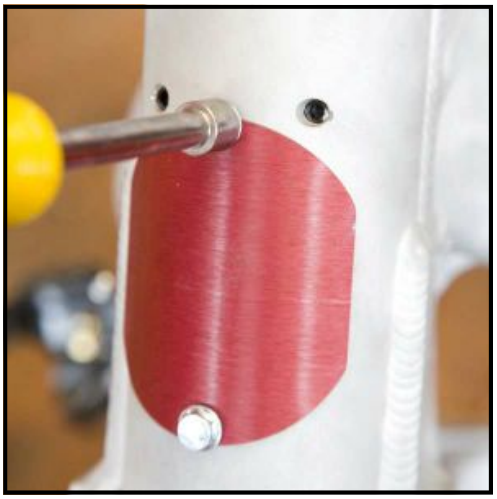
- Insert steerer tube into top triple clamp and tighten set screw to secure steerer tube.

- Slide the steerer tube bearing back onto the output gear.



- Press gear and bearing into top steerer tube.

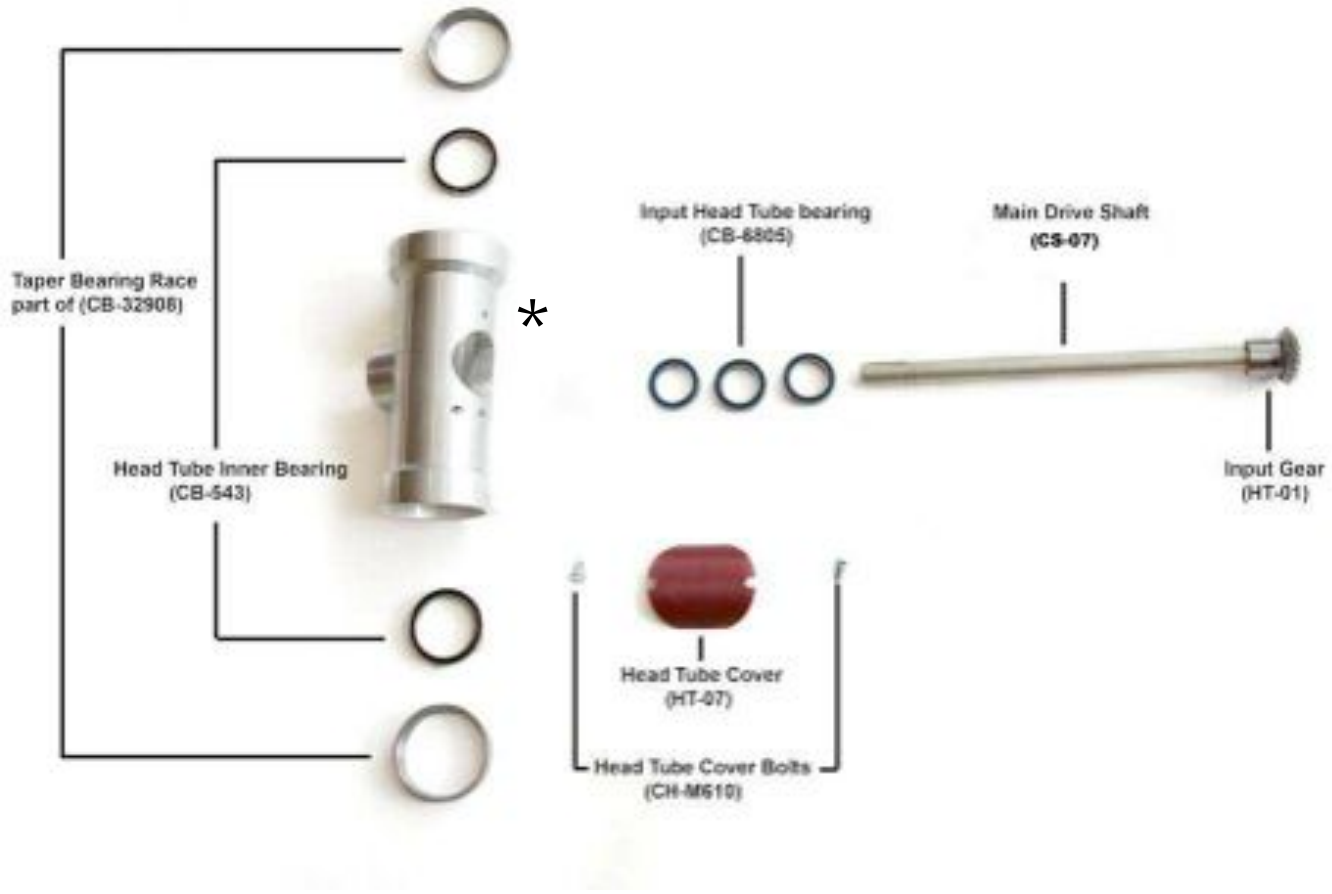
- Remove triples clamps as previously described.
- Remove the head tube cover from the front of the head tube.



- Slide the input head tube gear and main driveshaft out the head tube access port. The driveshaft will need to slide out of the clutch hub.

- If the 3 input bearings do not come out with the input gear and need to be replaced, gently tap them out with a punch. Make sure they do not get cocked as they are being tapped out.

Warning: If any of the head tube gears are damaged and need to be replaced, all of the head tube gears must be replaced together as a set.



* Picture above shows a head tube not welded to the frame for reference.

- Use a punch and remove the inner B543 bearings.

- If the taper bearing races are corroded or pitted, remove them with a punch.

- Clean the headset bearing surfaces with degreaser and apply a few drops of green Loctite.

- Install the inner B543 bearings using a bearing punch.

- Install the taper bearing races using a bearing punch.

- Slide the input bearings onto the head tube gear.

- Slide the driveshaft partially through the frame and install the clutch hub. **Be sure the clutch retaining snap ring is on the driveshaft before sliding the clutch hub onto the driveshaft.**

- Slide the driveshaft the rest of the way through the frame, seating the input bearings and gear in the head tube and the clutch hub with the clutch basket. Use a soft punch and lightly tap the gear to be sure it is fully seated.

- Move the clutch retaining snap ring into the groove closest to the clutch hub.

- Grease the top and bottom taper bearings with Spectro SPL or equivalent waterproof grease. Grease output gears with Shell grease.
- Check to make sure input head tube gear and bearings are completely seated in the back of the head tube.

- Slide top triple clamp assembly into the head tube.
- Before seating the top triple clamp assembly, make sure the output gear and input gear are beginning to mesh correctly.

Note: If the two gears are not meshing, it will not be possible to seat the top triple clamp correctly.

- Tap the top triple clamp with a plastic faced hammer to seat it completely.

Triple Clamp Installation

- Slide the bottom triple clamp into the head tube. **Note: Make sure bottom output gear is meshing with the input gear before fully seating the bottom triple clamp.**

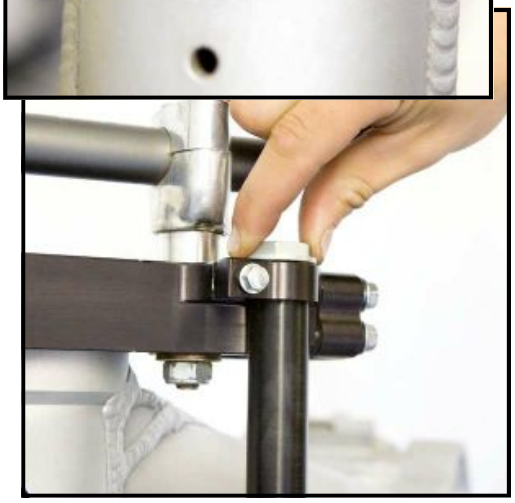
- Once gears are meshing correctly, tap triple clamp with soft faced mallet to fully seat.

- Slide top triple clamp into head tube, aligning preload bars.

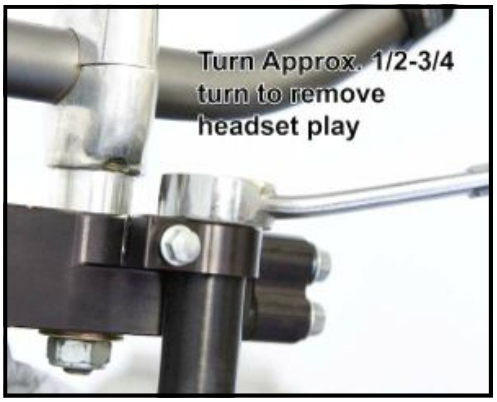
- Spin the left side sprocket driveshaft to align the bottom center sprocket (located inside the cavity) with the steerer driveshaft. Once turning the sprocket driveshaft also turns the top output gear, everything is aligned correctly.

- Ensure the top output gear is meshing with the back input gear and tap top triple clamp into place with soft faced mallet until it is fully seated.

- Screw the preload bolts down until they are flush with the top triple clamp.



- Turn the preload bolts evenly until there is no play in the head tube bearings (usually 1/2-3/4 of a turn).



- Tighten the preload bar pinch bolts.

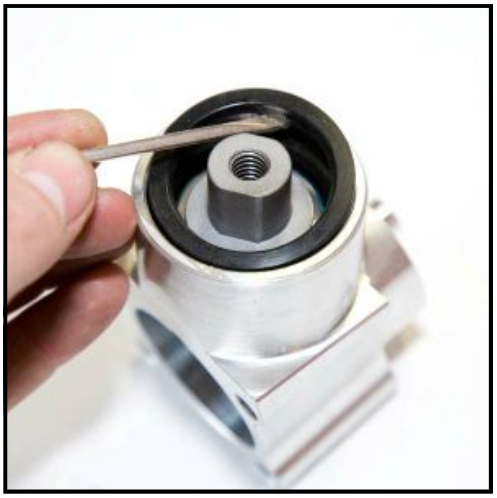
- Remove chain cover, chain and sprocket from frame (see “Cover/ chain removal” section).
- Remove cable and engagement spline from gearbox (see “AWD engagement cable” section).
- Slide clutch retaining snap ring up main drive shaft 6 inches or more.

- Slide clutch hub assembly up main driveshaft unit it clears the clutch basket.
- Remove 4 shoulder bolts from sidebar with 4mm Allen wrench.
- With Shoulder bolts removed, slide gearbox out of frame.

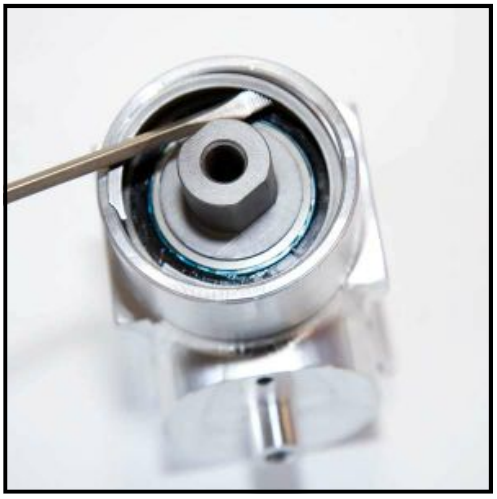
Output Snap Ring
(CSR-178)
Output Seal *
(CS-37474)
Output Bearings
(CB-6006)
Output Gear
(GB-03)
Gear Box
(GB-01)
Output Retaining Ring
(CSR-386)
Input Bearing
(CB-6005)
Input Gear Snap Ring
(CSR-148)
Input Gear
(GB-02)

- Slide clutch basket off output gear.

- Remove output seals from gear box.



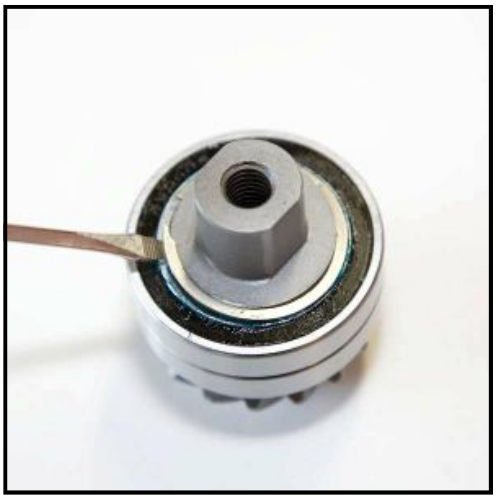
- Remove output snap ring.



- Slide output gear and bearings out of gearbox.

- Remove input gear and bearing from gearbox by tapping them out through the access holes in the back of the gearbox.

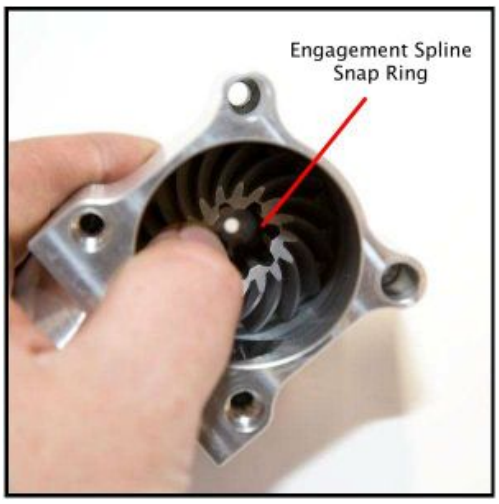
- Remove output retaining ring.



- Use split bearing puller to press output bearings partially off of the gear. After the bearings move away from the gear, use press to remove bearings completely.

- Use same steps to remove input bearing from input gear.
- Inspect gears and bearings and replace if needed.
- Carefully press new output bearings onto driven gear and replace retaining ring.
- Carefully press input bearing onto drive gear and replace engagement spline snap ring if it was removed.

Note: Make sure engagement spline snap ring is install on input gear before it is pressed into the gearbox



- Press input bearing onto gear and insert gear and bearing into gearbox.

- An aluminum punch and hammer may be needed to gently tap input bearing and drive gear back into place. Make sure bearing is fully seated at the back of the gearbox.

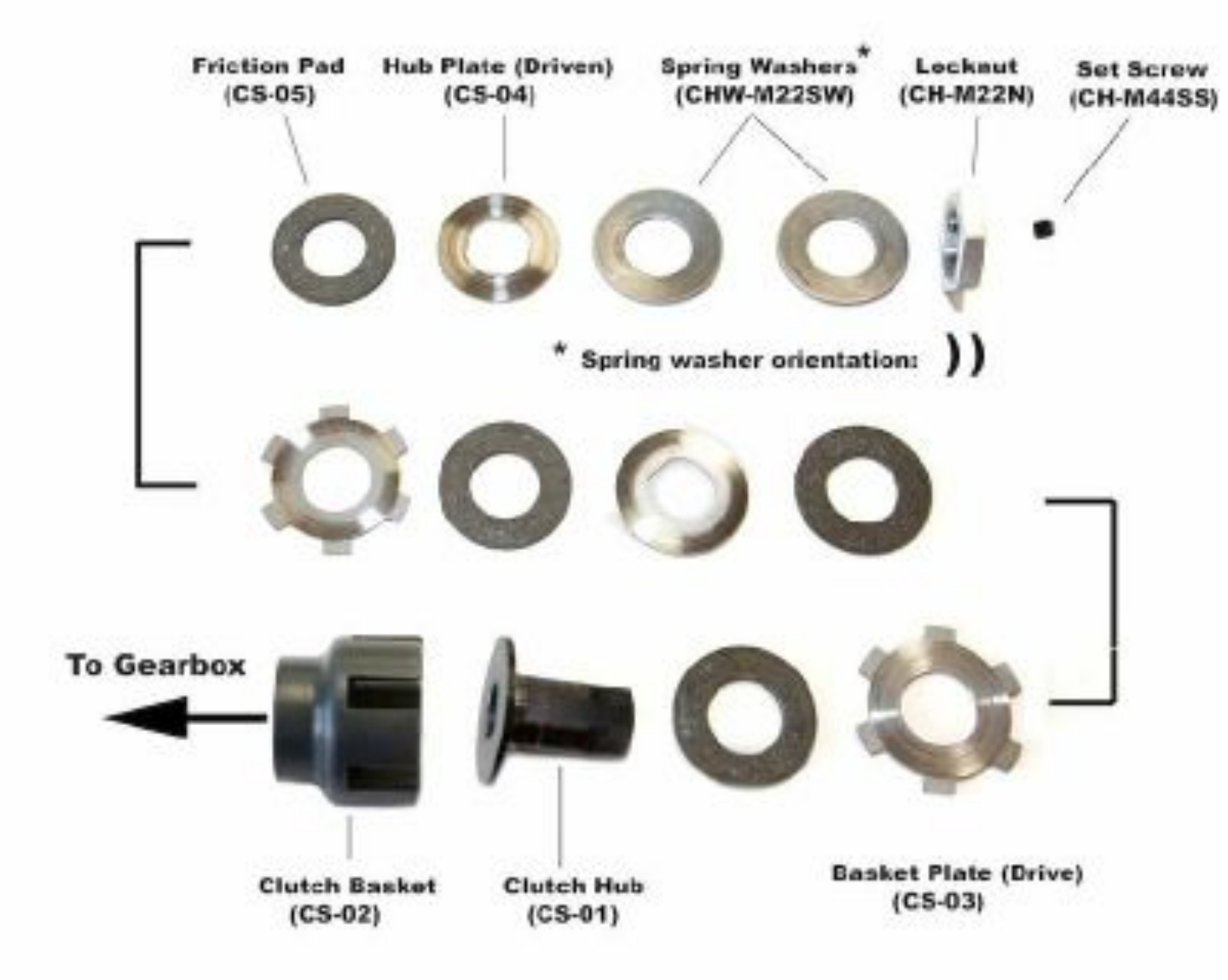
- Insert output gear and bearings into gearbox. Make sure gears mesh correctly as you are pushing the output gear into place.
- Reinstall output snap ring.
- Grease input and output gears using Shell Lithium grease.
- Install output seals into gearbox making sure seals are installed markings facing out.
- Grease lip of seals and push clutch basket back onto output gear.
- Clean any excess grease off of clutch basket.

- Remove chain cover and AWD chain (see “Cover/chain removal” section).
- Slide clutch snap ring up main driveshaft.

- Slide clutch up main driveshaft away from clutch basket.

- Remove 4 shoulder connect gearbox from sidebar.

- Move gearbox out of the way.
- Slide clutch off main driveshaft.


Friction Pad
(CS-05)
Hub Plate (Driven)
(CS-04)
Spring Washers*
(CHW-M22SW)
Locknut
(CH-M22N)
Set Screw
(CH-M44SS)
* Spring washer orientation:
To Gearbox
Clutch Basket
(CS-02)
Clutch Hub
(CS-01)
Basket Plate (Drive)
(CS-03)

- Loosen locknut set screw so it will not interfere with the hub threads.

Warning: Failure to loosen set screw will damage threads in clutch hub.

- Loosen locknut while clutch assembly is still on main driveshaft. To keep driveshaft from spinning apply front brake and put bike in gear.
- Remove clutch assembly from bike (see “Clutch Removal” section).

- Completely unscrew locknut. Remove spring washers, fiber pads and clutch plates and inspect for wear or damage.

Note: If metal plates are not scored or warped, they do not need to be replaced. Simply replace fiber plates during standard rebuilt.

- Reassemble clutch hub noting the order of the plates, fibers and spring washers. Be sure the spring washers are in the correct orientation:

- Apply anti seize compound to hub thread and thread locknut onto the hub by hand. **Note:** Use thread file to clean galled hub threads if needed.

- Reinstall clutch on bike.
- Reinstall clutch basket and gearbox.
- Tighten locknut until it is approximately flush with the hub.

- Check clutch settings and adjust as necessary (see “AWD Clutch Test” section).

- Adjust locknut so set screw hole lines up with the nearest flat section on the hub, and tighten set screw.

Warning: Once set screw is tightened, do try to turn locknut as this will damage the hub threads.

Problem	Solution
Front forks feel sticky	• Clean and lube fork seals. • Check to make sure forks are not twisted in triple clamps. • Lube front spline shafts with grease. • If this does not help, pull down dust boot and check spline shaft for damage. • Disassemble spline and check bearing for corrosion and damage. • Make sure front wheel axle bolt is not too tight and is not binding forks
Front wheel is not pulling	• Make sure engagement switch is turned on and the engagement spline is functioning properly. • Check clutch setting for proper torque using “wheel check method”.
Drive system is pulling to one side	• Perform “Sprag bearing test” as described in manual • Check sprag bearings in hub to make sure neither side is slipping. • Make sure that drive shafts are free to spin smoothly. Occasionally mud or other debris can hinder one driveshaft from spinning at the proper rate.
Clutch Basket has notches in it.	• This is normal. As long as the notches don’t exceed 3/16”, Replacement is not needed.
Cannot disengage system	• With bike in neutral rock it back and forth and use the lever to disengage the system. • Engagement cable has too much slack in it. Use barrel adjuster to take slack out of cable.

CHRISTINI AWD LIMITED WARRANTY

This LIMITED WARRANTY is a complete and exclusive statement of CHRISTINI's obligations to the ORIGINAL OWNER of a CHRISTINI AWD Motorcycle Kit.

CHRISTINI Technologies warrants:

-All **Modified frames** to be free from defects in material and workmanship **for a period of ONE (1) year** from the date of purchase for the Original Owner.

-All other original **CHRISTINI AWD components**, including the fork machined parts, front hub, gear box, and the components of the CHRISTINI All Wheel Drive (AWD) system including shafts and drive gears are warranted to be free of defects in material and workmanship **for a period of ONE (1) year** from the date of Purchase for the Original Owner.

OTHER ORIGINAL COMPONENTS

Any components not produced by CHRISTINI, including the front suspension fork internal mechanisms, bear their original manufacturer's own warranty and CHRISTINI reserves the right to direct any warranty request relating to those Other Original Components to said manufacturer's customer service department.

THESE WARRANTIES DO NOT COVER:

- Failures or required services which are not due to a defect in material or factory workmanship.
- Replacement of expendable maintenance items including, but not limited to:
- Bearings, including linear bearing
- Seals and O-Rings
- AWD Clutch Basket, Plates, and Friction Plates
- Shaft Bellows
- AWD Engagement cable and housing
- Sprockets and Drive Chains
- Parts or accessories affected or damaged by:
- Normal wear
- **Finish, including frame, anodized machine parts, and coatings on gears, sprockets and driveshafts**
- Improper maintenance including improper clutch settings
- Lack of proper maintenance
- Improper installation
- Deterioration from exposure to the elements
- The unauthorized alteration of any part
- The incorporation or use of unsuitable attachments or parts
- Unsuitable use in an application for which the part was not designed
- Neglect
- Misuse
- Abuse
- Vandalism

Failures caused by or related to any modification not approved by Christini Technologies, Inc.

- Failures caused by or related to any installation of any parts or kits designed for “competition only” use
- Use for the following activities: which will VOID these warranties:
  - Racing
  - Competition
  - Rental

LIMITED REMEDY

Unless otherwise provided, the sole remedy under the above warranty or any implied warranty is limited to the replacement of defective parts with those of equal or greater value at the sole discretion of CHRISTINI. No cash refunds will be offered under this warranty and you will be responsible for labor costs associated with warranty replacements. IN NO EVENT WILL CHRISTINI AWD BE RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, WHETHER BASED ON CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT PRODUCTS LIABILITY, INCLUDING, WITHOUT LIMITATION, PERSONAL INJURY DAMAGES, PROPERTY DAMAGE, OR ECONOMIC LOSSES.

Note: In those states that do not allow the exclusion or limitation of incidental or consequential damages, the above limitation or exclusion may not apply to you.

EXCLUSIONS

The above warranty, or any implied warranty, does not cover normal WEAR AND TEAR, and all warranties are void if the motorcycle is used for other than normal activities, including, but not limited to, the failure to follow the directions for assembly, the instructions, warnings and advice found in the owner's manual or using the motorcycle for commercial activities or in competitive events, including off road racing, motocross racing, stunt riding, ramp jumping or similar activities and training for such activities, or events. This warranty does not cover any damage, failure, or loss caused by accident, misuse, abuse, neglect, improper assembly, improper maintenance, or use of parts or devices not consistent with the original intent for the product sold.

CHRISTINI TECHNOLOGIES MAKES NO OTHER WARRANTIES, EITHER EXPRESSED OR IMPLIED. ALL IMPLIED WARRANTIES, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED, IN DURATION TO THAT OF THE EXPRESS WARRANTIES STATED ABOVE. Some states do not allow limitations on how long an implied warranty lasts so the above limitation may not apply to you. The warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

WHAT YOU SHOULD DO

Always wear a helmet while riding. Please remember to always ride safely and in control and within your capabilities and limitations. Even under normal riding, motorcycles can be dangerous due to changing and variable riding conditions including known and unknown hazards.

WARRANTY CLAIM PROCEDURE

- If a part is determined to be defective, return said part to your dealership for verification of a defect.
- The dealer will verify whether the part is defective. If the part is determined to be defective by the dealer, the part will be replaced and the amount of the replacement part will be charged to the customers credit card until it is returned to Christini for verification.
- Alternatively, the dealer may opt to send the part in for verification before replacement.
- Upon receipt of the defective part/parts, Christini will determine if the part is eligible for warranty compensation.

If the part is found to be defective, the customer will be credited the full amount of the replacement part.

This Warranty applies only to the Original Owner (first retail purchaser from motorcycle dealer, distributor, or direct from Christini)

Bring your AWD kit or motorcycle along with your purchase receipt or other proof of the date of purchase to the dealer where you purchased the AWD Kit or write to the Warranty Service Department at:

CHRISTINI AWD

421 N. 7th Street, Suite 200

Philadelphia, PA 19123

Phone: (215) 351 9895

Freight costs and any labor charges for part change overs, assembly, repair, or disassembly are the responsibility of the Original Owner and **this Warranty offers no cash refunds.**